~~PERIODICAL DEPARTMENT~~
SAN FRANCISCO HISTORY ROOM
X R

SAN FRANCISCO PUBLIC LIBRARY
VITA SINE LITERIS MORS EST

Book No. Accession
f621.12 P11 35 468208
NOT TO BE TAKEN FROM THE LIBRARY
FORM 3427—5M—8-35

PACIFIC MARINE REVIEW

ANUARY
938

Let's Start Rebuilding Our Merchant Marine in 1938

Some of Swayne & Hoyt's 13 Ships in their Gulf-Pacific Line service

. . . *you can easily tell* *that* HE'S A THOROBRED

Few people would be fooled when they looked at little Scotty. His class and breeding show in every line.

So it is with many products that you buy. Almost at a glance you know its quality—or its cheapness.

But in the selection of rope, appearances cease to count. Little indeed can the average person tell by looking at it the strength, the stamina, the dependability that a piece of rope may have.

When you buy rope for any Marine use, you must be governed by far more than appearance. You must depend upon the integrity and experience of the manufacturer for the service and protection that you expect.

For 82 years, the mills of Tubbs Cordage Company have been making rope that has become the standard of the Marine field. To be sure when you buy rope, specify SUPERCORE and EXTRA SUPERIOR MANILA.

TUBBS
ROPE

TUBBS *Cordage Company*
200 BUSH STREET SAN FRANCISCO

PACIFIC MARINE REVIEW

JANUARY 1938
VOL. XXXV NO. 1

x f 621.12 P11 35

468208

CONTENTS

Editorial Comment:

Retrospect and Prospect 17

"Let's Start Rebuilding Our Merchant Marine in 1938" 18
I. Some Comment on the Building Program Proposed by the Maritime Commission.

"Yellow Magic" on the High Seas 24
By Langbourne M. Williams, Jr.
Solving the Problems of Loading and Shipping Sulphur in Bulk.

Efficient Boiler Equipment on New Tankers 27

Your Problems Answered 28
By "The Chief."

For American Deck Officers 31
Some Hints on Shipkeeping.

1937 Marine Electrical Developments Reviewed 33
By H. C. Coleman.

Reconditioning a Pacific Coast Tanker 36

New Type Marine Steam Generator 38

On the Ways:

Latest News from American Shipyards 41
First of the California Tankers 42
Building in American Yards 44

Two Shallow Draft Towboats 58

Miscellaneous:

Foreign Trade Zone Port Experience, 26; Efficient Boiler Equipment on New Tankers, 27; Engineers' Licenses, 29; Literature of the Industry, 30; Deck Officers' Licenses, 32; Coordinating Air and Surface Overseas Transport, 35; Trade Literature, 37; Improved Iron Castings for Marine Use, 40; Insurance Syndicate Expands, 47; A Monthly Review of Tanker Markets, by Oscar J. Beyfuss, 48; An Interesting Tug Conversion, 56; A New Marine Storage Battery, 62; Chinese Marine Designs Will Be Shown at S.F. Fair, by Chingwah Lee, 62; Covic Diesel Pacific Company, 64.

Our Frontispiece

Our frontispiece this month is the notable American clipper Morning Light, from the painting by Charles R. Patterson, published through the courtesy of the Grand Central Art Galleries of New York and reproduced from a photograph of the painting made by Peter A. Juley and Son, fine arts photographers, of New York City.

PUBLISHED AT 500 SANSOME STREET . . . . SAN FRANCISCO

Entered as second class matter June 20, 1913, at the post office, San Francisco, under the Act of March 3, 1879. Published on the 1st of each month. Advertising and editorial forms close on the 15th. Subscription price, one year: Domestic, $1.50; foreign, $2.50; two years: Domestic, $2.50; foreign, $4.00; three years: Domestic, $3.00; foreign, $5.50; single copies, 25c. Chas. F. A. Mann, Northwest Representative, 1110 Puget Sound Bank Bldg., Tacoma, Washington. New York Office, Suite 404-405-406, Two Hundred Broadway, Telephone COrdlandt 7-3579.

In New York City copies of Pacific Marine Review can be purchased at the news stands of I. Goldberg, 42 Broadway; Jacob Fuchs, 17 Battery Place; Philip Mandara, Greenwich Street and Battery Place at 25c per copy.

J. S. Hines	B. N. DeRochie	Alexander J. Dickie	Paul Faulkner	F. Dryden Moore
President and Publisher	Assistant Publisher	Editor	Advertising Manager	Assistant Editor

Charles Robert

Flash . . .

New Tanker Contracts at $37,556,000

As we go to press comes confirmation of the signing on January 3 of contracts for 12 tankers to be built by four shipyards for the account of the Standard Oil Company of New Jersey and the U. S. Maritime Commission.

This contract calls for delivery of all ships within 3 years at a total cost of $37,556,000, of which $10,563,000 will be paid by the Maritime Commission, and the balance by the Standard Oil Company of New Jersey.

The Standard Oil Company is to be congratulated for its patriotism in signing the agreement necessary to have this construction program consummated. Standard Oil Company agreed in the contract to maintain these vessels in operating condition for the next 20 years.

The contract price is the result of competitive bidding on two designs—one for a commercial tanker of 12 knots sea speed, such as the oil companies are now building; the other for a tanker of 16½ knots sea speed, such as is now desired for the U. S. Navy.

The difference between the bids for the two types determined the U. S. Navy-U. S. Maritime Commission share in the first cost. Since the oil company is assuming all the additional cost of operating such ships, we must congratulate them on their patriotism.

The four shipyards involved in this contract for three ships each are: Newport News Shipbuilding and Dry Dock Company; Sun Shipbuilding and Dry Dock Company; Bethlehem Shipbuilding Corporation, Sparrows Point Plant; and Federal Shipbuilding and Dry Dock Company.

The twelve vessels will be built to a standard design which is the joint product of experts from the Standard Oil Company, the U. S. Navy, and the U. S. Maritime Commission. Its principal characteristics are: length between perpendiculars, 525 feet; beam molded, 75 feet; depth molded, 39 feet; draft loaded, 29 feet, 10½ inches; deadweight on loaded draft, 16,300 tons; cargo capacity, 150,000 bbls.; propulsion by twin screws driven by geared turbines with total shaft horsepower of 12,800; and speed on trial, 18 knots.

Present at the signing of this agreement were: Joseph P. Kennedy, Chairman, U. S. Maritime Commission; Rear Admiral William D. Leahy, Chief of Naval Operations, representing the U. S. Navy; Robert L. Hague, Vice President and Manager, Marine Department, Standard Oil Company of New Jersey; Maritime Commissioner Emory S. Land; Max O'Rell Truitt, Counsel of the U. S. Maritime Commission; and some ten or more representatives of oil companies and of the shipyards involved.

This contract is the largest peace time commercial shipbuilding contract in American shipbuilding history.

It is especially interesting as an illustration of cooperation between Big Business and the U. S. Government, brought about by the liberal interpretation of a very sensible clause in the Marchant Marine Act of 1936.

Assuming that the U. S. Navy had to have such tankers, we can easily see by simple arithmetic that this contract has saved the U. S. Government in construction costs alone over $27,000,000. To get the whole picture we must add at least as much more for what would have been the Government cost of operation and maintenance for twenty years.

By spending ten million in this way the Maritime Commission saves about forty-five million for the tax payers of America.

This is good business and we congratulate the Maritime Commission.

PACIFIC MARINE REVIEW

VOLUME XXXV JANUARY 1938 NUMBER 1

Retrospect and Prospect

Nineteen thirty-seven has been a very confused and jittery period for American ship operators, and particularly so for Pacific Coast ship operators. Maritime labor, Maritime Commission, Senate committees, Bureau of Marine Inspection, have all been promulgating new and more stringent demands and rules, the application of which all tend to make operation more costly.

The demands and rules of labor greatly increase operating costs and make practically impossible the application of discipline or the preservation of morale at sea.

The failure of the Maritime Commission to establish a definite subsidy policy makes the future of ship operation in foreign trade lanes very uncertain, and makes capital very hesitant about investments in shipping.

The activities of congressional committees result in the imposition of much unnecessary red tape regulation that increases the overall cost of ship operation.

The application of Bureau of Marine Inspection new rules for safety equipment puts large additional financial burden on many operators.

During 1937, due largely to the above reasons, the Pacific Coastwise passenger services were practically eliminated and Pacific Coastwise cargo services greatly curtailed.

During 1937 also several intercoastal cargo and passenger services were consolidated, some were curtailed, and some eliminated.

During 1937 several of the Pacific Coast foreign trading ship operators were placed in very embarrassing situations because of uncertain policies of the Maritime Commission.

Taking all these circumstances into consideration we may conclude that Pacific-American shipping is today on a basis of practically bed rock and that we should now be able to begin to build a better and more useful Pacific-American merchant marine.

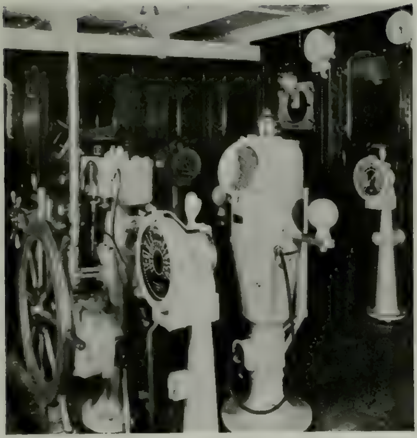
We know that the majority of the foreign trade routes operated from Pacific Coast ports are basically essential trade routes. As such they must be protected under the Merchant Marine Act of 1936 or any conceivable subsidy legislation. On many of these routes our operators are badly in need of new, efficient, speedy vessels to compete with the modern craft operated by their competitors.

The shipbuilding program has already started. Tankers are building in American yards on a larger commercial construction program than ever before in the history of American shipbuilding, and this program will probably go on for many years. The Maritime Commission has let a contract for the largest passenger liner yet built in an American yard, and has called for bids on 12 cargo vessels. Five passenger and cargo coastwise steamers are under construction.

However, a fleet of ships does not in itself make a merchant marine. That composite organization which is defined under the term "merchant marine" must include many factors. Some of these factors are intangible, some very concrete, but all must be reckoned with by the successful ship operator. Many of these factors as they affect the American merchant marine need to be reconditioned and/or rebuilt. Let's start on this job while the fleet is rebuilding.

"Let's Start Rebuilding Our Merchant Marine in 1938"

"Let's Start Our



I. *Some Comments on the Building Program Proposed by the Maritime Commission*

A merchant marine is a very complicated fabrication, much of which is composed of invisible and almost imponderable elements that must be built up over a long period and that require constant vigilant nursing to prevent their evaporation and the possible collapse of the entire structure.

The most tangible and, of course, one of the most important elements of a national merchant marine, is the fleet of ships that are its operating tools. When we speak of rebuilding our merchant marine we mean primarily the process which will ultimately furnish that merchant marine with a new set of tools—a new fleet of ships. However, in addition to the ships there are many other elements which are necessary, and many of these must also be rebuilt, so that in any careful analysis of a rebuilding program all these elements must be considered. The single ship, however, will take a year or more to build, so we must consider first getting started on the ships and while the ships are building we must recondition, rebuild, and re-equip all the other elements that should be included in a well designed, properly built merchant marine structure. The principal elements to be drydocked, repaired, reconditioned, scraped, cleaned and painted are:

(1) **Legislation.** Much of this element, that is now obsolete and outmoded—acting as a growth of weeds or barnacles to slow up progress—should be scrapped and discarded. In its place there should be added a carefully prepared code of law based on the needs of modern transportation services.

(2) **Personnel.** The American merchant marine needs a complete revision of ideas and conceptions concerning both officer and crew personnel. The officers and crew need an entirely new basis of training and education. Even the operating executives may have to get a new education.

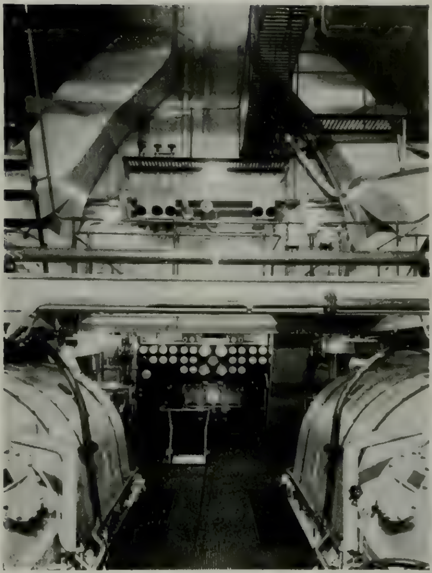
(3) **Ports.** The great majority of American ports are operating on 19th century ideas in a 20th century world. Perhaps we shall find many handicaps here that can be removed by intelligent concerted action.

(4) **Insurance** is an important element in a successful merchant marine. Is our American set-up for marine insurance capable of improvement?

(5) **Shoreside Personnel.** Can anything be done to improve the efficiency of longshoremen, checkers, tally clerks, passenger and cargo agency personnel so that costs of shoreside operation may be reduced without cutting wages?

(6) **Shipping Finance.** Working capital is the bone and sinew of modern business. It has been very wary

Rebuilding Merchant Marine in 1938"



of American shipping. What must be done to get capital interested?

These and many other questions face us as we enter 1938 determined to "Start Rebuilding our Merchant Marine." It is our intention to cover all of these matters in a series of articles running through the year. In this first article of the series we are considering the fleet—the ships we need — types, numbers, speeds, equipment.

● Rebuilding Our Merchant Fleet

As we write, the special session of Congress is being bombarded with many merchant marine bills, each of which is designed to make possible an early start of the rebuilding program announced by the U. S. Maritime Commission. The largest unit of that program, the 730 foot passenger liner for the United States Lines, is already under construction at the Newport News Shipbuilding and Dry Dock Company. The Maritime Commission is promising immediate calling for bids on 20 vessels of various types, including 10 of their standard cargo vessel design.

(Before this article got to press bids were called for on 12 vessels on this standard cargo carrier design.)

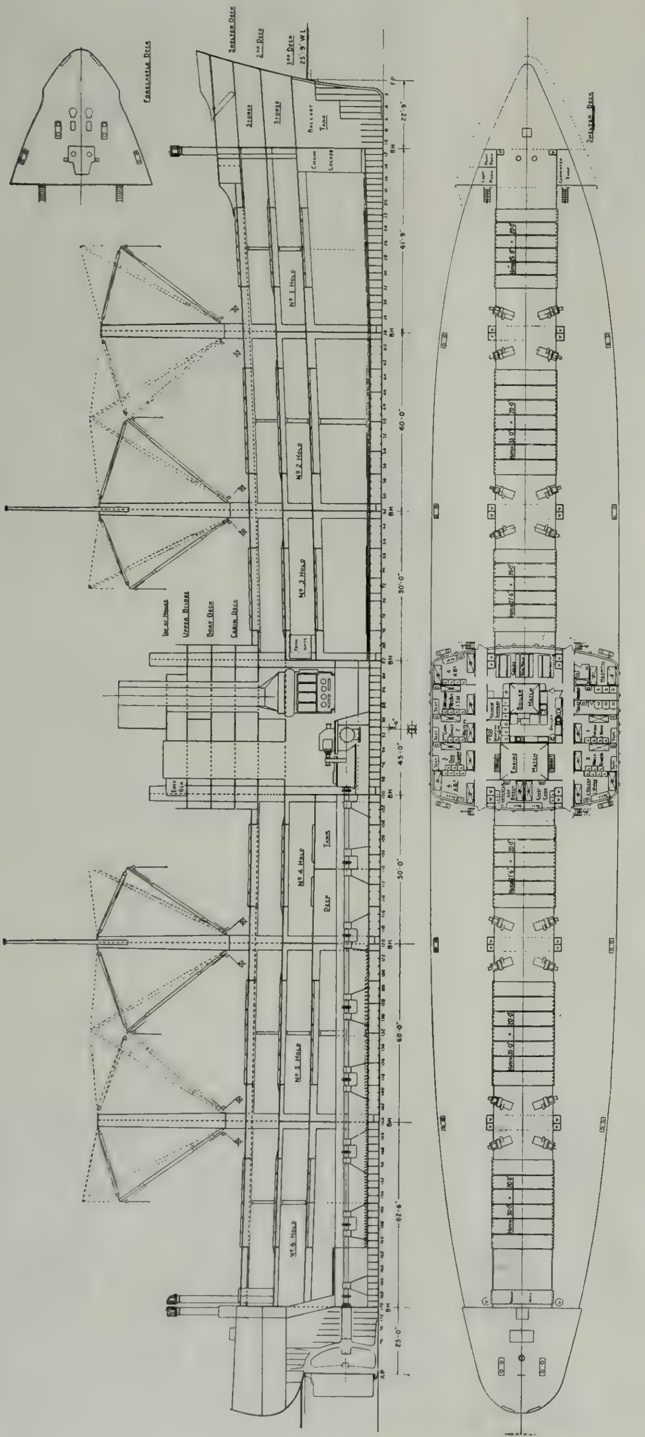
Along with these promises for the immediate future the large oil companies are steadily ordering replacements for their tanker fleets. The Navy is ordering both fighting and auxiliary craft.

Altogether the total gross tonnage now under construction or order in American shipyards and Navy yards is greater than that of any year since 1923. That this work is to be largely increased is certain and that fact should be of great comfort to the American shipbuilding industry, which has had many very lean seasons during the past fifteen years. Some shrewd observers are convinced that the present prospects for American shipbuilding are rosier than at any time in the recent history of that industry.

Granting that this is the case, it must be a matter of great concern to the American ship operator in overseas trade that this Government inspired shipbuilding program shall produce vessels that will be, as to their respective types, world leaders in safety, in overall operating economy, in comfort, in dependable schedules, and in service to the shipping and traveling public.

The principal reason for this activity in American shipbuilding is not lack of ships but the fact that the great majority of American ships are so old that they have become too deteriorated and too obsolete to be profitable competitors with the newer ships of other nations.

A running mate for the Manhattan (at left) is already under construction. We hope that several ships similar to the Lurline (at right) will soon be on our shipbuilding ways.



Standard Cargo Vessel Design C-2 U. S. Maritime Commission

GENERAL CHARACTERISTICS

Length O.A.	459', 0"
Length B.P.	435', 0"
Beam molded	63', 0"
Depth at side	40', 6"
Draft loaded	25', 9"
Displacement at this draft	13,812 tons
Deadweight capacity	8,767 tons
Deadweight cargo capacity	7,137 tons
Bale capacity	550,000 cubic feet
Volume capacity per cargo ton	77 cubic feet
Gross measurement	6,228 tons
Block coefficient	0.687
Longitudinal coefficient	0.699
Midship section coefficient	0.98
Parallel middle body percentage	12.5
G. M. light	9.25'
G. M. loaded	3.13'
Sustained sea speed at load draft	15 knots
Designed normal shaft H.P.	6,000

Single screw drive by double-reduction gear cross compound steam turbines.

Two water tube boilers.

Steam conditions 450 lbs. 750° F.

Designed propeller revolutions	80
Diameter of propeller	20 feet
Steaming radius at 15 knots	13,000 miles
Weights:	
Steel hull	3,704 tons
Wood and outfit	769 tons
Machinery	660 tons
Passengers, crew, and effects	10 tons
Stores	10 tons
Fresh water, potable	25 tons
Reserve feed water	259 tons
Fresh water, miscellaneous	112 tons
Oil fuel	1,214 tons
Ship ready for sea without cargo	6,763 tons

At left: Inboard profile and shelter deck plan of C-2 design standard cargo vessel.

SAN FRANCISCO
PUBLIC LIBRARY
PERIODICAL DEPT.

A normal life period for the steel hulls of ships is 20 years. By that time deterioration has progressed to the point where upkeep is beginning to make large inroads on income. Some 85 per cent of our steel steamers in the overseas trade have reached that point already or will have reached it by 1941-42. Many of our vessels need replacement on this score.

● Obsolescence

Obsolescence is another story. A ship, like an automobile or any other manufactured article, may be practically obsolescent before she is launched. Such was the case with many of our war built cargo carriers of the standardized types. These vessels, designed eight years before the last of them were finished, came into immediate competition with post-war designs and speeds in European vessels. They were therefore not usable or salable here or abroad. Hence many ships during the later period of that shipbuilding effort went directly from the builders' yards to storage on some mud flat to await a more favorable opportunity, which never came.

Nearly all of the vessels now operated by our principal competitors in overseas trade routes have been designed and built since the war. These ships have incorporated refinements in hull design and technical advances in marine engineering, much of which was unknown when America was building her great fleet of cargo vessels. As we see the world's merchant marine picture today, it would seem foolish for any nation starting to rebuild its merchant fleet to standardize on types, speeds, drives, or sizes for competitive vessels unless they can make their standard equal to or better than the very best afloat of its type.

If we are satisfied to begin a building program with a standard which is any less than the best obtainable we will find ourselves at the end of this shipbuilding effort in much the same position as in 1920, i.e. with a lot of more or less obsolete vessels on our hands.

● Maritime Commission Program

The tentative program of replacements for the American merchant fleet as developed by the experts of the Maritime Commission calls for 95 vessels of types and estimated costs as follows:

46 cargo vessels	$58,880,000
14 cargo vessels	19,040,000
10 cargo and passenger vessels	40,000,000
10 cargo and passenger vessels	55,000,000
1 special liner	15,000,000
10 tankers	28,520,000
95 vessels	$256,440,000

This program was authorized by Congress in August, 1937, as an initial unit of a five year program calling for the building of 225 to 250 vessels at an estimated cost of $520,000,000.

Construction work began on this program in November, 1937, with the formal signing by the Maritime Commission of a contract with the Newport News Shipbuilding and Dry Dock Company for the construction of the special liner item at a cost of $15,750,000 (adjusted price basis). This cost figure is only 5 per cent higher than the estimates made by the Commission.

This vessel, so far as form, speed, machinery, and size are concerned, is the ideal for the majority of the traveling public on the North Atlantic today. We thoroughly agree with the position taken by the Maritime Commission on the matter of super liners of high speeds and monster size. Economically these huge liners are a liability. The same amount of capital and subsidy as would be necessary to maintain a service with two or three such vessels could maintain a fleet of air transports of far greater speed and of equal overall capacity.

As military or naval auxiliaries the huge ships are not nearly so valuable as the medium sized liners. Only a few of the world's ports can accommodate them, and they cannot pass through the Panama Canal.

COMPETITION

The chief competition to American flag ships in foreign trade on the Pacific Ocean comes from large fleets of new, fast, modern European and Japanese motorships. A fine example is the Danish motorship Canada (at right) of the East Asiatic Company of Copenhagen.

However, since the program calls for only one special liner we need not interest ourselves further in the details of her design, since it is not establishing a standard.

Mainly of interest in this respect are the 60 cargo vessels in two classes with 14 ships in one class and 46 in the other. The estimated cost of these units is $1,360,000 for each of the 14, and $1,280,000 for each of the 46. As we write the Commission has called for bids on 12 of these vessels. We reproduce herewith profile, deck plan, machinery layout and outline midship section of the standard design for these ships as issued by the Maritime Commission. General characteristics are given in the table herewith.

This design has many excellent points as to form and type. There are, however, several details in which it seems to us the design stops short of being a good standard design for a competitive overseas trade vessel for future successful use. The arrangement of the interior space for both passengers, crew, and cargo will, of course, need to be changed to meet the requirements of the various trades.

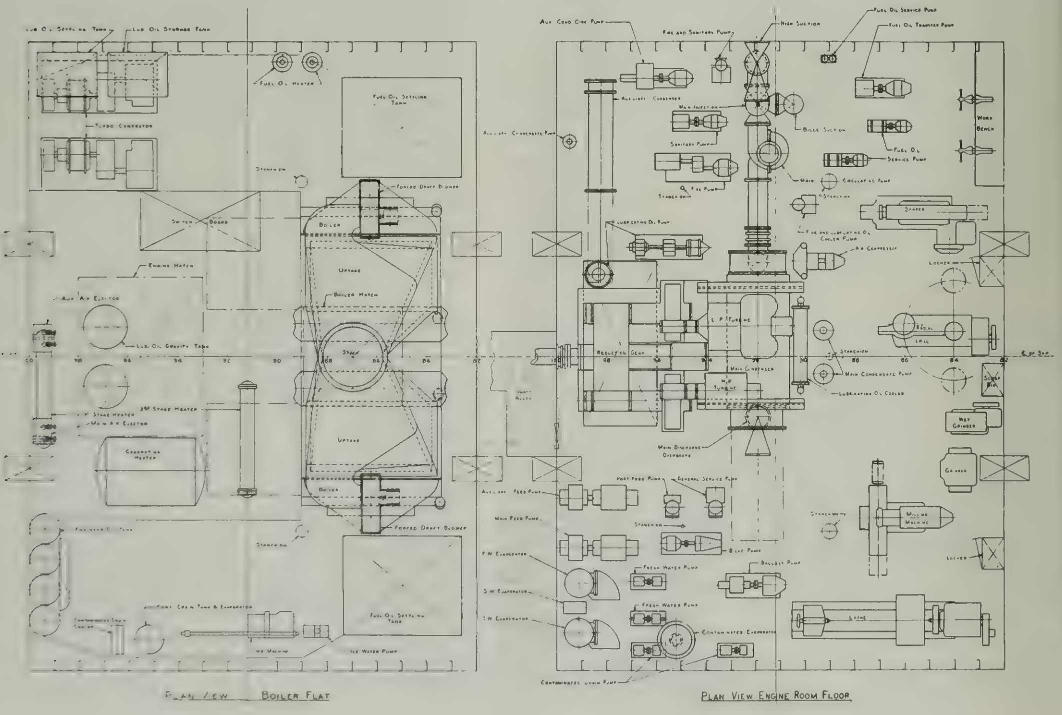
From the standpoint of operation in overseas trades out of Pacific Coast ports we would suggest that the deep tanks for fuel oil be moved to forward side of the forward bulkhead of the engine room, and be run from tank top to 2nd deck. To get the same cubic capacity for oil this tank would require a fore and aft length of approximately 22 feet. We would then divide the space between this tank and the forepeak bulkhead into two main cargo holds each 75 feet in length and each with a hatch 20 feet by 35 feet.

We would remove all stanchions in way of hatches, and compensate for this with center line bulkheads between hatches and transverse webs in way of hatch ends. We would carry transverse watertight bulkheads up to shelter deck so that with heavy cargoes we could fill the space and take advantage of greater allowable draft.

Placing the deep tank and spacing the holds and hatches thus would allow an extension of the midship superstructure forward for about 25 feet, thereby permitting larger passenger staterooms and public rooms. We would devote the entire cabin deck to the 12 passengers, place the engineers on the shelter deck level and the crew in the poop.

This arrangement has the advantage of giving the passengers an exclusive space for recreation, for eating, and for sleeping quarters. Such exclusive space is becoming more necessary as the eight hour day rule at sea puts two thirds of the crew off duty all the time. In other words, it is hardly a fair proposition to ask 12 passengers on such a ship to pay good money for board and lodging in a small house where approximately 30 members of the crew are sleeping or loafing all the time.

The passenger accommodations on this cargo vessel as designed could never be sold in competition with



C-2 cargo vessel design. Plans of engine room, showing machinery arrangement.

those installed on Scandinavian, Dutch, British, French, German, Italian, or Japanese vessels of similar class and speed.

Crew accommodations in the poop could be made more comfortable and with larger recreation rooms than are provided in the small deck house of the C-2 design. The crew's mess room and the galley could be arranged on the after end of the amidship house on the shelter deck level.

Design details which we personally would wish changed if we were building such a vessel for operation anywhere are:

(1) Flat decks. We certainly would put in some camber on the decks of a 60 foot beam hull.

(2) No bilge. We would certainly want bilge drainage at the side of the hold floors.

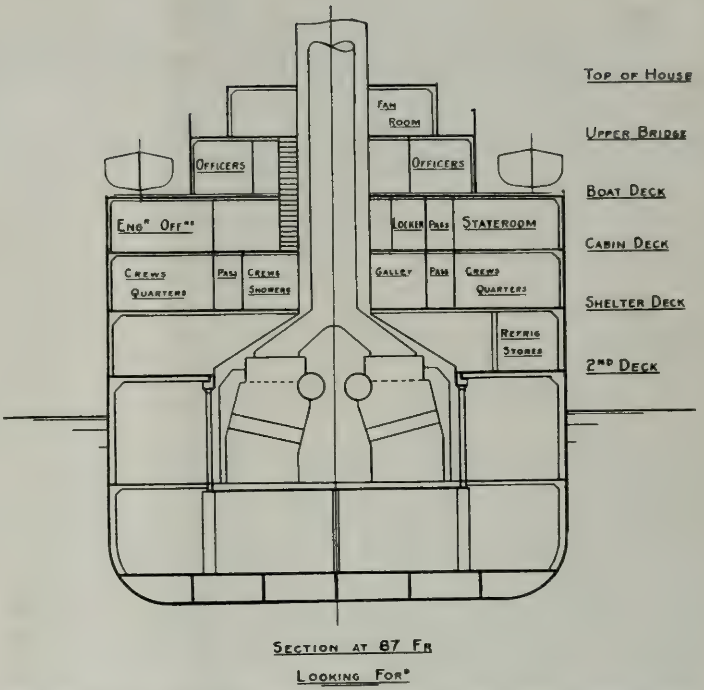
(3) Propeller speed. With modern designs of propellers considerable deadweight could be saved to advantage by increasing the propeller speed 50 per cent to 120 r.p.m. and decreasing propeller diameter to from 13 to 14 feet. The tip speed of the smaller wheel at the higher revolutions would be a little less than that of the 20 foot wheel at designed speed. The propeller diameter reduction would give more depth of water over the tips. This extra depth of water might give sufficient additional surplus propulsive efficiency to offset the slight reduction due to the increased revolutions.

(4) Bow form. The modified Maierform type of bow offers many advantages in maintaining schedules against head winds.

(5) Rudder. There is much advantage in having a balanced rudder on a vessel of this size and speed.

(6) Superstructure form. We would certainly give the forward end of the superstructure a much more pronounced streamline effect.

The first cost of the hull with these proposed changes would be slightly higher. The first cost of the machinery would be somewhat lower. The total overall cost would be a little higher, perhaps 5 per cent. The resultant ship, however, would be well worth the additional cost as a better competitor in any operator's trade route.



C-2 standard cargo vessel design. Diagrammatic transverse section through machinery spaces.

Steam pressure is another item of this design on which it may not be wise to standardize at the figure set. American power plant engineering has led the way into higher ranges of steam pressures. Why should American marine engineering be content to stick around 400 pounds? Germany has already gone to 1300 pounds in marine plants with great benefits in space and weight savings and some fractional benefit in fuel consumption.

It is well understood that the principal benefits from the use of higher steam pressures in marine propulsion plants lie in space and weight savings. These savings, however, are largely confined to new construction in which the entire vessel is designed to take fullest advantage of their possibilities. Hence the importance of going to the higher pressure ranges in any proposed program of new standardized construction.

There are great possibilities inherent in the welding process, by the use of which carefully designed standard assemblies of portions of the ship's structure may be duplicated in fabrication and riveted or welded into the ship's hull. Examples are the stem, the stern, the tank structure in way of engine foundations, bulkheads, and any special reinforcing members in way of auxiliary machinery foundations.

We have no desire to hold up the program of building until these or any other changes are made in designs. The majority of the proposals made herein can be handled in the detail work in shipyards with little if any alteration in costs. We simply wish to emphasize the obvious fact that in producing a standard design for vessels which are to be run in competitive trade routes we should look first at the design features necessary for successful competition and build our standard design around those features. Then we should carefully study the standard design to reduce first cost in its building. First cost is important, but it is only one out of several important elements, in the design of a vessel that is to successfully meet the competition of the world's finest merchant ships.

(To be Continued)

"Yellow Magic" on the High Seas

Problems of Loading and Shipping Sulphur in Bulk Solved in Unique Ways by Freeport Sulphur Co.

By Langbourne M. Williams, Jr.
President, The Freeport Sulphur Company

Sulphur has been the "yellow magic" of mankind for 4000 years of recorded history, but it took sound engineering rather than magic to plan and erect the terminal facilities at Freeport, Texas, and Port Sulphur, Louisiana, from which the Freeport Sulphur Company annually ships hundreds of thousands of tons of the vital raw material to all parts of the world for use in agriculture and industry.

Deep in the delta region of the Mississippi, about 45 miles south of New Orleans, where the company's Louisiana plant is located, the most discouraging difficulties were encountered when construction of the plant and shipping facilities was actively undertaken in 1933. Land, in the ordinary sense of the word, was virtually non-existent, the entire surface of the property consisting of a peaty matting of brown swamp grass ranging from several inches to several feet in thickness and floating on an oozy subsurface. The soil thus offered little or no support for the loading structures and other necessary buildings, and a forest of approximately 35,000 75-foot piles was sunk into the swampland for foundation purposes.

Waist-deep in the muck and water, workers labored more than a year to complete this industrial miracle before the first shipload of sulphur moved down the Mississippi to the Gulf.

In the first place, it was found literally impossible to transport sulphur from the wells over 10 miles of swamp to the river bank, so 2,000,000 cubic yards of mud and dirt were moved in the digging of a canal. On this canal, which ends just short of the Mississippi River bank, the company now operates a fleet of barges to carry the sulphur from the storage vats near the wells to the loading dock at Port Sulphur.

Because of the boggy condition of the quarter-mile of land separating the canal from the storage vats—each of which holds thousands of cubic yards of solidified sulphur—a series of 36-inch conveyor belts was installed to move the sulphur to the barges after it has been broken into small lumps by blasting.

When the barges reach the river end of the canal the sulphur is removed by a bridge crane, and either dumped on conveyor belts for direct loading into ships or put in temporary ground storage. The conveyor

At left: A mountain of sulphur being loaded into cars by traveling crane.
At right: A power shovel loading sulphur onto a conveyor for transfer to barges.

belt carries the sulphur from ground level up over a roller bridge across a highway and the river bank, and empties it into an elevated hopper at the dock. The dock and loading mechanism are equipped to accommodate ships of unlimited length and up to 35-foot draft.

In the loading of sulphur, we have found that the only precaution necessary is to equip the men doing the actual loading with goggles so that the fine sulphur dust will not irritate their eyes, and even this measure is not required aboard the ship once the sulphur is in place in the hold.

By use of the ingenious loading devices at Port Sulphur it is possible to load sulphur at the rate of 600 tons an hour. Today the shipping interests, relying on the experience gained through years of handling sulphur, have come to look upon this mineral as an almost ideal deadweight cargo.

In the early days of sulphur shipping, one of the requirements was that two steel bulkheads separate the sulphur from any other inflammable cargo. As experience proved the safety of shipping sulphur this was reduced to one, and today sulphur is stored in the holds of ships, in some cases, with only a wooden flooring separating it from the next cargo layer, which may be a material as highly inflammable as cotton. In addition, sulphur as a cargo has the advantage of not being subject to shifting, as is the case with some grains, for instance.

Sulphur shipped out of Port Sulphur, Louisiana, goes up the Mississippi to Chicago and other river ports, and down the river to the Gulf, bound for the East and West Coasts and foreign ports in approximately 35 countries.

The shipment of sulphur by steamer out of Freeport, Texas, about 40 miles southwest of Galveston Bar, has been facilitated by the completion of an elaborate program in which local and Federal interests cooperated. The Brazos River Harbor Navigation District, a political subdivision, constructed a dam and canal diverting the Brazos River above Freeport so that it empties into the gulf about 10 miles west of the river mouth. This project overcame the difficulties engendered by the alluvial deposits which formerly varied the Brazos River depth. Today, due to the work done, a dependable depth of 30 feet has been provided.

The loading dock at Freeport — which is approximately two and one-half miles from the open sea—will accommodate ships 500 feet and more in length, and with a draft of 30 feet.

Freeport is approximately 18 miles from the Texas plant, but, unlike the operations in Louisiana, the sulphur here is transported by rail in gondola cars directly to the loading dock. Once the cars are at the dock they are pulled up an incline by cable to an elevation of approximately 50 feet, where the sulphur is dumped into hoppers. This system is soon to be replaced, however, and by the first of the year our engineers will have installed a new conveyor belt system to replace the cars which are pulled up the incline to the hoppers.

As is the case in Louisiana, the sulphur is conveyed from the hoppers to the ship holds through aluminum chutes. Cast iron chutes were used when the plant was first built, but it was soon discovered that the friction created by the sulphur as it slid down the chute was sufficient in some cases to ignite the mineral.

Our engineers solved this problem

Upper: Conveyor loading sulphur on a barge at the inland end of Port Sulphur canal for transport to deep water on the Mississippi River.

Lower: Bird's-eye view of the river at Port Sulphur, showing the end of the canal and the ground storage back of the levee, and conveying system for loading ships in river.

by designing an aluminum chute which is so smooth that the danger of ignition is practically eliminated. In addition, the chute is constructed in telescopic sections to facilitate the loading of the sulphur in the holds of the ships. Loading directions are given by a man on the deck of the ship, signaling to an operator who controls the telescopic chute.

The loading terminal at Freeport has a capacity of about 400 tons an hour, but in addition to the shipping of sulphur by water from the Texas property a great deal is sent by rail to points throughout the United States.

An interesting feature in connection with the transportation of sulphur is that, unlike most raw materials, while it is shipped in a crude state it is generally destined directly for the consumer in industry and agriculture without further refining. This is made possible by the fact that unusual methods of mining along the Gulf Coast produce a raw material 99½ per cent pure.

The foregoing improvements which have been made in the handling of sulphur, coupled with solutions to the problems of extraction which were evolved only after years of intensive exploration and research, are now making available at low cost a substance which is in almost universal use, and which has come to be regarded as virtually indispensable. In addition to the uses of sulphur in agriculture and medicine, which stretch back into antiquity, the yellow mineral also acts as a cornerstone for the growing structure of modern industrial operations.

Without sulphur there could be no automobiles to ride in, since sulphur is a vital ingredient in rubber tires and scores of other parts essential to the modern motor car. There would be no movies, steel bridges, or thousands of other present-day commodities, for sulphur is literally a necessity in countless industries. In fact, so universal are the tasks which sulphur performs that the wheels of industry would be virtually unable to turn if "yellow magic" were taken out of the world.

Foreign Trade Zone Port Experience

According to dispatches from the Department of Docks of the City of New York, operator of the New York foreign trade zone, the Augsburg, owned by the North German Lloyd, a vessel of 6,512 gross tonnage and 420 feet in length, whose home port is Bremerhaven, docked at the Staten Island foreign trade zone, Pier 15, on October 18, 1937, with a large cargo of Mexican garbanzos, or chick peas, from the west coast of Mexico.

This cargo consisted of 10,166,182 pounds, or 4,538 long tons, of peas, the duty on which is 1¾ cents per pound, or a total of $177,906. By discharging the shipment at the zone the necessity of either paying the duty at the time of entry or filing a bond of $355,812, double the amount of the duty, was obviated.

The Pacific Coast needs one or two foreign trade zones where cargoes can be sorted, graded and treated in the zone without paying duty or putting up expensive bonds. They would be much used by both foreign and American flag ships.

These garbanzos will be sorted, graded, and fumigated in the zone, the greater part to be reshipped to Cuba, British West Indies, and Haiti. It is interesting to note that this one shipment is larger than the total imports of garbanzo beans through the New York Customs District in any one year since 1931, the nearest approach being the total imports of 7,408,103 pounds in 1933. In addition to the work of unloading the cargo, which took about 150 longshoremen several days, a considerable amount of additional work will be provided Staten Island labor in the manipulation processes which will likely require several weeks.

Garbanzo beans, or chick peas, are used both for human consumption and stock food.

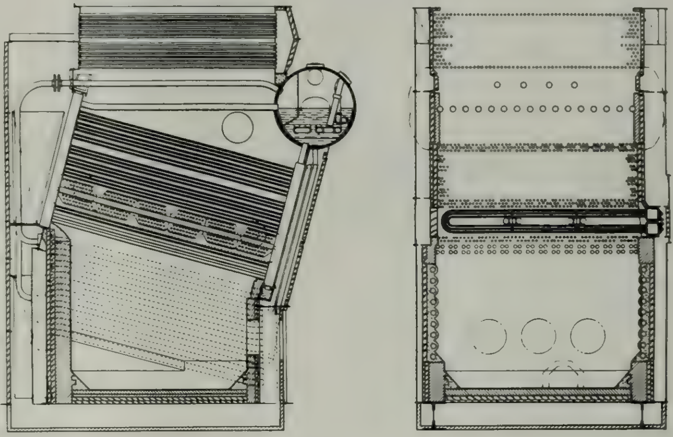
● Mobile Zone

The Alabama State Docks Commission opened bids on October 26 for constructing a barrier around the foreign trade zone which has been authorized at Mobile, Alabama. It is the hope of the grantee that the zone will be ready for operation by the first of next year.

● Italian Free Ports

A material enlargement of the free zones now provided in Italian ports is deemed advisable by experts and by the shipping press. At the present time there are in Italy only two ports which may be regarded as strictly free ports, that is, entirely free from the assessment of customs duties. These are Fiume and Zara. In some other Italian ports special facilities are provided similar to those of the free ports for certain types of merchandise. Among these may be mentioned Trieste, Genoa, Naples, and Venice. These special facilities are areas set aside, and may be compared to foreign trade zones in this country. Plans are well advanced for improvement of these zones, especially the one in Genoa.

Efficient Boiler Equipment on New Tankers



Fore-and-aft and thwartship sectional elevations of Babcock and Wilcox marine water tube boiler of the sectional-header, single pass type.

Two tankers, the Wallace E. Pratt and the Esso Baytown, were recently completed by the Sun Shipbuilding and Dry Dock Company, and after thorough sea trials delivered to the Standard Oil Company of New Jersey. Both of these tankers passed their tests very satisfactorily and are now in commission, giving very economical service in overseas oil transport for their owners.

Both ships are driven by Westinghouse cross compound, double reduction gear, impulse-reaction turbines developing normally 3500 shaft horsepower at 85 revolutions a minute on the propeller shaft.

Steam is supplied by two Babcock & Wilcox oil-burning boilers equipped with steam superheaters, air preheaters, and water-cooled furnaces. The boilers are of sectional-header, single-pass type, designed to operate with a steam pressure of 425 pounds at the superheater outlet. Sinuous headers are used to obtain uniform tube staggering, so as to have all the generating tube surface swept by the combustion gases to obtain high efficiency. At normal operation the steam capacity of the two units is 33,500 pounds, and at maximum capacity, 62,700 pounds, with 725 F. steam temperature.

The superheaters are of the interdeck type, arranged with the tubes running transverse to the boiler tubes and extending the entire width of the boiler.

The superheater headers, into which the tubes are expanded, are located between the outer and inner boiler casings and are readily accessible. There are four rows of boiler tubes between the superheater and the furnace, thus protecting the superheater tubes from direct flame impingement from the oil burners.

Steam desuperheaters of the internal-drum submerged type furnish the low temperature steam required for auxiliary purposes.

By the use of air heaters, the gases from the boilers preheat the air for combustion to approximately 350 degrees. The temperature of the gases leaving the air heater and entering the stack is 280 degrees, indicating the heat extracting characteristics of this design of boiler unit. The use of an air heater has the following definite advantages:

1. Improved overall heat balance of the ship;

2. Improved combustion due to the use of high combustion air temperature;

3. Lower maintenance with the use of non-pressure parts for heat recovery.

The water-cooled furnace sidewalls consist of a vertical row of inclined tubes expanded into headers at the front and rear of each wall. These tubes are of B&W Stud-Tube construction in which studs welded to the face of the tubes on the furnace side hold securely a covering of chrome plastic refractory around and between the tubes. The chrome refractory covering on the tubes will not only resist the high furnace temperatures incident to oil firing, but also the slagging action that would be encountered with ordinary refractory, resulting in low furnace maintenance.

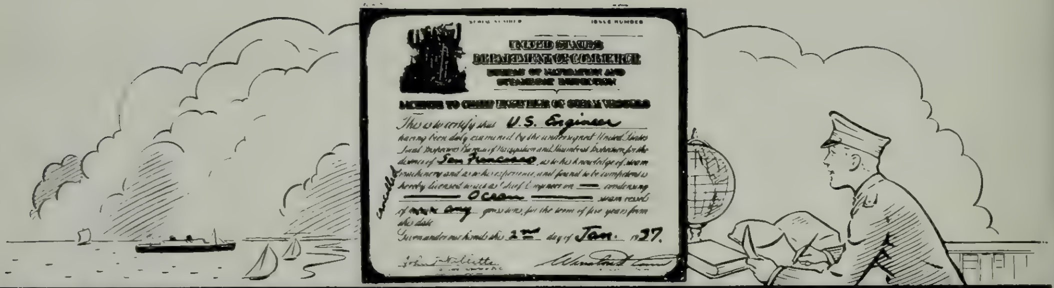
The feedwater temperature will be 300 degrees, and the flow will be regulated to maintain a constant level in the drum by a Bailey Thermal feedwater regulator.

With the improved spacing and arrangement of boiler tubes and air heater tubes, it is not necessary to resort to any baffling to deflect the gases over the different parts of the heating surfaces. The omission of baffles in the air heater gives a straight gas-flow, and eliminates ledges or pockets where soot would collect, and which might be a fire hazard as well as a corrosion hazard.

This design of boiler, with all the generating, superheater, and waterwall tubes accessible for inspection, cleaning, and repair from the outside of the boiler, is particularly desirable for tanker service, in which the ships are at sea the greater part of the time, and remain in port usually only a matter of hours.

The boiler is encased in a double casing so arranged that all the air for combustion passes around the boiler casings and headers, reducing the heat loss from radiation to a minimum, and maintaining the fireroom comfortably cool.

Sufficient soot blowers are provided to maintain the heating surfaces clean at all times.



UNITED STATES
DEPARTMENT OF COMMERCE
BUREAU OF NAVIGATION AND STEAMBOAT INSPECTION

LICENSE TO CHIEF ENGINEER OF STEAM VESSELS

This is to certify that U.S. Engineer having been duly examined by the undersigned United States Local Inspectors Bureau of Navigation and Steamboat Inspection for the district of San Francisco, as to his knowledge of steam machinery and as to his experience, and found to be competent is hereby licensed to act as Chief Engineer on — condensing — Ocean — steam vessels of any gross tons, for the term of five years from this date.

Given under our hands this 2nd day of Jan. 1937.

Cancelled

Your Problems Answered

by "The Chief"

The word "Cancelled" was inscribed on face of the above license at the direction of the Bureau of Marine Inspection and Navigation. As used here it means "Specimen Copy."

QUESTION

What are the power and speed characteristics of a propeller, both ahead and astern?

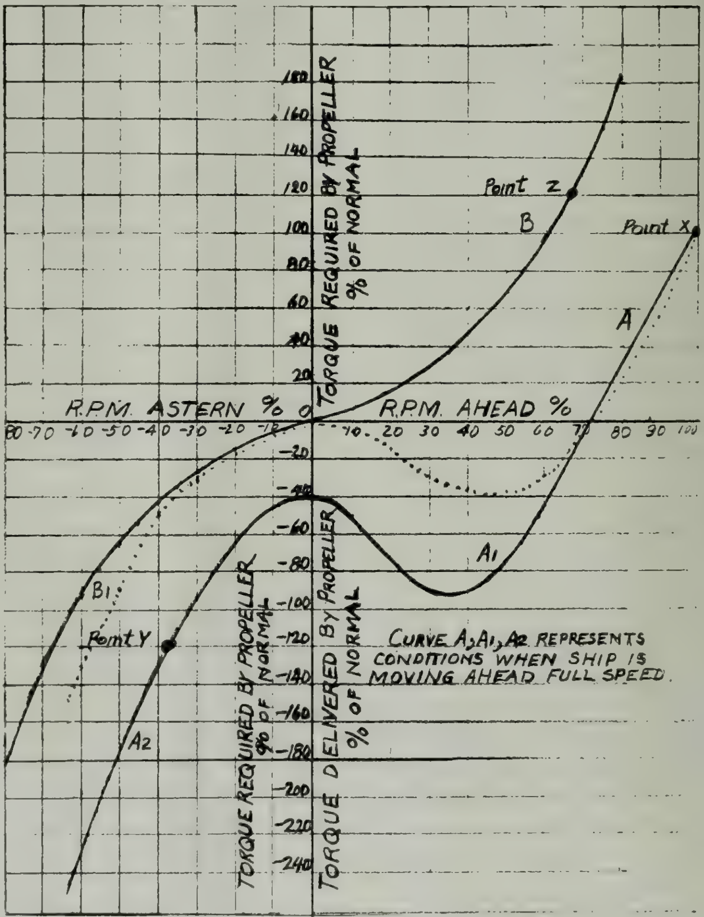
ANSWER

A proper discussion of this question involves a thorough understanding of the meaning of power and of torque. To review our fundamentals let us recall that:

(1) Torque is the twisting effort on the shaft. It represents the turning force produced by the engine on the shaft and in turn by the shaft on the propeller. It is measured in pounds-feet. This is a unit representing the number of pounds applied at the rim of a gear two feet in diameter, or a one foot radius. Thus 1000 lbs. applied at one foot from center of rotation gives 1000 pounds-feet torque. The same twisting effort would be produced by 200 pounds at five foot radius or at the rim of a 10 foot diameter gear. Hence the torque would still be 200 x 5 equals 100 pounds-feet.

(2) Power is the rate of delivery of energy. Its unit is the horsepower equals the rate of doing work of hoisting 33,000 pounds at one foot per minute. It is a rate unit, just as is the knot a unit of speed. Thus 1000 H.P. means delivering energy or doing work at the rate 1000 x 33,000 foot-pounds per minute.*

Refer to the accompanying figure



Torque characteristics of screw propeller of average design.

---

*Note the foot-pound is a unit of work and the pound-foot is a unit of torque, two entirely different units.

showing the speed torque characteristics of a marine screw propeller of average design.

The 100 per cent speed or r.p.m. point is the revolutions per minute to give full speed of the ship. The 100 per cent torque point likewise is the torque required from the engine to turn the propeller at 100 per cent speed with the ship at full speed.

Curve A A_1 A_2 is plotted to cover conditions of r.p.m. and torque with the ship at full speed ahead. Thus point X on this curve shows 100 per cent torque required to give 100 per cent r.p.m. If the engines were reversed under a full speed astern bell, and if they were capable of giving 120 per cent torque, or 20 per cent more than normal, the revolutions would come up to only about 38 per cent normal astern, as shown at point Y.

Furthermore, that section of the curve represented by the letter A with torque and speed both ahead, and with ship at full speed ahead represents the reduction in torque required as the r.p.m. is reduced. Thus with the r.p.m. at 72 per cent no torque is required and the propeller is just turning through the water with no slip and no thrust. Hence this is the speed the propeller would turn if it were uncoupled from the engine.

The part of the curve represented by A_1 shows the condition where a drag were imposed on the shaft, such as friction of engine or a brake or if astern steam were admitted but not enough to stop the ahead motion. Here the torque is reversed and becomes negative. This means that the propeller is trying to turn the engine and is doing work on the engine or braking friction.

And finally the curve indicated by A_2 represents the condition of sufficient astern steam to actually reverse the engine into astern r.p.m. with the ship going full speed ahead. At the point where r.p.m. is zero we find a drag torque of -40 per cent. This, then, indicates the torque that the jacking gear must hold if the shaft is locked against turning and ship is full speed ahead.

Also note that we probably never could get full speed astern, i.e., 100 per cent r.p.m. astern with ship at full speed ahead, as our engines would have insufficient torque. 230 per cent torque in astern direction is required to bring r.p.m. to 60 per cent astern.

The dotted line represents H.P. in terms of per cent of normal and corresponding to the speed and torque of A A_1 A_2. It is evident that for conditions much different from normal speed the H. P. of the engines is not a satisfactory characteristic to study. At zero H.P. we have both 72 per cent r.p.m. or -40 per cent torque.

Often the expression is used "the backing H.P. of the engines." According to the curves a backing H.P. of 50 per cent would require 120 per cent torque to give only 38 per cent astern r.p.m., which would probably be the most we could get with ship at full speed ahead. The H.P. under this condition does not mean much. The real question is, what is the torque? With reciprocating engines it is thus customary to give full stroke admission astern to develop this extra torque. With turbines the astern nozzles are proportioned to pass more than normal steam flow. Electric motors must be designed for this condition.

It should be remembered that H.P. is the product of the r.p.m. and the torque. The relationship is $H.P. = \frac{T \times r.p.m.}{5250}$ when H.P. = horsepower, T = torque in pound-feet, or $T = \frac{5250 \times H.P.}{r.p.m.}$

Curve B B_1 represents the speed-

Engineers' Licenses

The following list shows the licenses granted during the month of November to engineer officers of the merchant marine at Pacific Coast offices of the Bureau of Marine Inspection and Navigation. For key to abbreviations see footnote.

Name and Grade	Class	Condition
JUNEAU		
James J. Henderson, 2nd Asst. Eng.	OSS, any GT	O
SEATTLE		
George I. Kachen, Chief Eng.	OSS, any GT	RG
A. H. Yngve Hedner, 2nd Asst Eng.	OSS, any GT	RG
PORTLAND		
Gail C. Shapley, Chief Eng.	OMS, 300 GT	O
3rd Asst. Eng.	OMS, any GT	
J. Frank Turpin, Chief Eng.	OMS, 300 GT	O
George T. Rose, Jr., Chief Eng.	OMS, 300 GT	O
1st Asst. Eng.	OMS, 450 GT	
Martin L. Williams, 1st Asst. Eng.	OMS, any GT	RG
Fred J. Schroeder, 2nd Asst. Eng.	OSS, any GT	RG
George W. Huddleston, 3rd Asst. Eng.	OSS, any GT	O
SAN PEDRO		
Alexander Campbell, Chief Eng.	OMS, 1000 GT	O
Erland Johnson, Chief Eng.	OMS, any GT	O
Charles T. Ewell, 2nd Asst. Eng.	OMS, any GT	O
John J. Flanagan, 1st Asst. Eng.	OMS, any GT	O
William F. McManus, 1st Asst. Eng.	OMS, 750 GT	O
SAN FRANCISCO		
Roy G. Lattin, Chief Eng.	OSS, any GT	RG
James George, Chief Eng.	OSS, any GT	RG
John C. Thompson, Chief Eng.	OSS, any GT	RG
Wesley J. Cumberland, Chief Eng.	OSS, any GT	O
Wallace W. Herne, Chief Eng.	OSS, any GT	RG
Percival N. Harding, Chief Eng.	OSS, any GT	RG
George Hubbard, Chief Eng.	OSS, any GT	RG
Paul J. Du Mont, Chief Eng.	OSS, any GT	RG
Frank J. Howley, 1st Asst. Eng.	OSS, any GT	RG
Robert A. Bannister, 1st Asst. Eng.	OSS, any GT	RG
Oswald G. Parker, 1st Asst. Eng.	OSS, any GT	RG
Cyril T. White, 2nd Asst. Eng.	OSS, any GT	RG
William J. Collins, 2nd Asst. Eng.	OSS, any GT	O
Roland M. J. Keen, 3rd Asst. Eng.	OSS, any GT	O
Duke E. Buchanan, 3rd Asst. Eng.	OSS, any GT	O
Raymond B. Ransom, 1st Asst. Eng.	OMS, any GT	O

Abbreviations: GT is gross tonnage; RG is raised grade; O is original license; OSS is ocean steamer; OMS is ocean motorship.

torque characteristics with the ship tied up to the dock.

Thus with ship at standstill and a full speed ahead bell, the engines would give us a revolution of only about 68 per cent r.p.m. and would require 120 per cent torque to do it, and our revolutions would not come up to normal until the ship's speed was nearly normal.

The exception to the above is the case where the engines are more powerful than the propeller and cavitation results.

QUESTION

What is cavitation?

ANSWER

Cavitation occurs when the propeller is turned so strongly that the reaction of the water on it is not adequate to hold it and it breaks away from its water. This would be the case where the propeller was too small for the engines; did not take hold of enough water to restrain it from breaking away.

Another way of thinking of this is to note that when cavitation occurs the water on the forward or suction side of the blade does not follow the blade but leaves it, leaving a vacuum. This may immediately close up, resulting in a severe water hammer, which explains the jarring and vibration under this condition. The pressure which causes the water to follow the blade is the water head over the blade plus atmospheric pressure. Water head is .434 lbs. per square inch for each foot of head. Thus a 14 foot head would give about 6 lbs. per square inch and plus 14.7 from the atmospheric pressure we have a total of 20.7 lbs. per square inch on the surface of the forward side of blade. If the blade pulls away from the water with a force greater than this pressure times the area, the water fails to follow and cavitation occurs. Hence the importance of having the propeller submerged as deeply as possible.

Localized cavitation may occur when otherwise conditions are well proportioned and normal. This may be due to lack of good streamlining of the blade section. The trailing edge may be so thick as to leave a small vacuum or void trailing it. Conditions around the hub may cause it. Or the blade tips may be so close to the surface that swirling water allows air to be sucked down to trail the blade.

QUESTION

Should twin screw ships turn propellers inboard or outboard for best results?

ANSWER

Authorities differ on this point. It would be unsafe to make any general conclusions.

The shape of the hull, location of struts, rudder arrangements, all enter into the problem. A safe conclusion is that suitable and satisfactory design can be made for either rotation.

QUESTION

What causes propeller noise and vibration?

ANSWER

This is a very general question. Many factors enter to cause vibration. To minimize vibration the propeller must:

(1) Be in good mechanical balance, and if revolutions are over 150 r.p.m. must be dynamically balanced.

(2) The blade shape must be streamlined as well as the hub, nut, and struts.

(3) The blade must be equally and symmetrically shaped.

(4) The propeller must not be overloaded or overspeeded.

(5) The surface of the blades must be smooth. Even small pits or barnacles may cause noise.

(6) There must not be too much clearance in the stern tube bearing.

(7) All blades equal pitch.

Even with ideal design vibration will occur under abnormal conditions, such as astern running or heavy and pitching seas.

Our next series will discuss propulsion gears.

Literature of the Industry

Bulletin de l'Association Technique Maritime et Aeronautique; 698 pages, with 198 drawings and illustrations, attractively bound in cloth; published by the Association at 7 Rue de Madrid, Paris, France. Price 250 fr. (postage 16 fr.)

This volume is the 1937 transactions of the French society of marine and aeronautical designers and engineers. It contains the papers read at their annual meeting held in June, 1937, together with the complete discussion thereon and a complete list and analytic directory of all the 738 papers read at the society's meetings since its foundation.

Twenty-five important papers were read at the 1937 meeting. Among the subjects covered were: Studies of the laws governing model testing (2 papers); the theories and technique of lubrication (2 papers); better efficiency in marine steam generation (3 papers); studies in strength of materials under various phases of modern design practice (7 papers); structure design and power plant engineering in aeronautics (10 papers); and one paper on industrial management.

This is a very important publication for anyone vitally interested in ship operating, shipbuilding, or aeronautical problems.

Preventing Welding and Cutting Fires, an illustrated booklet of 16 pages published by The Linde Air Products Company and containing rules and recommendations for safeguarding against fire in flame welding and flame cutting operations. The text is based on the combined perience of oxy-acetylene equipment users, equipment manufacturers, National Fire Protection Association, National Safety Council, and International Acetylene Association.

Welded Piping, a 12-page illustrated booklet published by The Linde Air Products Company and describing the advantages of welded joints in installing pipe systems.

Subjects of particular interest to builders, architects and engineers are treated in sections on: Pipe and services to be welded; lighter than standard weight pipe; fast, economical welding methods; layout, drawings and specifications; welded

(Page 32, please)

For American Deck Officers

SHIPSHAPE

Some Hints on Shipkeeping on Board Modern Vessels

Back as far as we can remember, the word "shipshape" was a part of the shipping business. This word was used to express the general impression everyone had of a ship. Sailing vessels were prepared for their arrival in port by being painted from the truck down, and the officers and crew were proud on arrival to see people come to the docks to admire their handiwork. The yards were trimmed as nearly in line as it was possible to get them without measuring. All lines were coiled up, the sails were furled as smoothly as possible, and the decks were freshly holystoned.

This tradition has been handed down to the present day steamer, and sometimes we wonder how the officers of the steamers accomplish the results you see on the waterfront. The ships are a credit to the merchant marine. At the present time it is necessary to plan ahead for weeks the work that must be done, as there are no delays in the present age. The old time sailing vessel would sometimes be delayed in a calm for days, and sometimes weeks, at which time the needed painting and repair work could be accomplished.

The chief officer of a modern vessel must get his work done in a set time, rain or shine, and he must have it planned so that if it rains he has work to do inside, and outside work for good weather. He must also keep one job from spoiling another, and on the passenger vessels he is limited to working or painting where there is no danger of disturbing or interfering with passengers. Some of the freight vessels are as well kept as any of the ships of the past. You may go on board in port and you will find all the gear coiled up, the topping lifts with whippings and not back spliced, the winch falls well greased, and all running gear overhauled. It's not only the cargo gear but the paint work and storerooms that show good care. On such ships you find the spare equipment as well taken care of as that in use, and storerooms in which you can find what you want without turning everything inside out.

When you board a ship that has the outside appearance of being shipshape you can bet anything that the quarters and everything else are in good order. It is likewise true that you can usually judge an officer by the way he keeps his own room.

There is one thing that is as important in the care of a vessel as anything else, and that is sanitation; not merely to see that the decks are clean but also to maintain sanitary conditions in the cold storage spaces where food is kept. Ice boxes should be dried out as often as possible and wooden boxes coated with shellac whenever they are in need of it. The cleaning process should include a scalding with hot water, as this will kill any mildew or bacteria that may have accumulated. The reason wooden boxes need shellac is to prevent the wooden surface from becoming exposed to moisture. Where this surface is bare the boxes absorb moisture, which will not only rot the wood but help in the forming of mildew or mold. Good clean boxes that are well kept are fifty per cent of the battle of keeping good food in right condition on long voyages.

While on the subject of "shipshape" vessels we may as well have a few words on the subject of the

Change of Masters

Steamer F. H. Hillman: J. S. Christenson; Vice, Don Thomson.
Steamer Point San Pablo: Peter Lund; Vice, C. P. Carson.
Steamer Noyo: John Bostrom; Vice, W. Nielsen.
Steamer Panaman: C. K. Khaury; Vice, J. A. Gaidsick.
Steamer Makaweli: J. H. Hansen; Vice, H. P. Pennoyer.
Steamer Charles L. Wheeler, Jr.: H. Danskannen; Vice, Peter Lund.
Steamer Mapele: Frank M. Graham; Vice, K. L. Melamphy.
Steamer Watsonville: F. H. Johannsen; Vice, A. Joen.
Steamer Manulani: C. L. Brocas; Vice, C. H. Morgan.
Ferry Boat Golden Age: C. F. Frese; Vice, R. M. Peabody.
Steamer Point Ancha: Walter Hansen; Vice, W. C. Johnson.
Steamer Baldbutte: F. D. Arthur; Vice, W. J. Birch.
Steamer Corrales: H. L. Poulsen; Vice, O. Evenson.
Steamer Mana: J. B. Blain; Vice, George Sidon.
Pan Motorship Beulah: Sven Erickson; Vice, O. Bradago.
Steamer Makiki: Eina F. Lono; Vice, J. E. Dollard.
Steamer Pat Doheny: E. Rutel; Vice, K. J. Olsen.
Steamer Maunawili: H. R. Gillespie; Vice, F. J. Hansen.
Steamer R. J. Hanna: R. M. Melbye; Vice, S. C. Sullivan.

Deck Officers' Licenses

The following list shows the licenses granted during the month of November to deck officers of the merchant marine at Pacific Coast offices of the Bureau of Marine Inspection and Navigation. For key to abbreviations see footnote.

Name and Grade	Class	Condition
SEATTLE		
Albert E. Bamforth, Master	OSS, any GT	RG
Richard S. MacRae, 2nd Mate	OSS, any GT	O
Ray K. Michaels, 2nd Mate	OSS, any GT	RG
Joseph J. Sawaska, 2nd Mate	OSS, any GT	RG
Charles L. Best, 3rd Mate	OSS, any GT	O
Eric E. Forbes, 3rd Mate	OSS, any GT	O
Bill W. Henshaw, 3rd Mate and Pilot	OSS, any GT	RG
William K. Keagy, 3rd Mate	OSS, any GT	O
Phillip V. Sullivan, 3rd Mate	OSS, any GT	O
PORTLAND		
Norman E. Wilcox, Master	OSS, any GT	RG
Jacob J. K. Tellert, 2nd Mate	OSS, any GT	O
SAN PEDRO		
William C. Swett, Master	OS or OM Yachts, any GT	O
Richard W. Bender, 2nd Mate	OSS, any GT	O
Joseph F. Dessert, 3rd Mate	OSS, any GT	O
Harder L. Hansen, 2nd Mate	OSS, any GT	RG
SAN FRANCISCO		
Harry L. Liberg, Master	OSS, any GT	RG
Elvin C. Hawley, Master	OSS, any GT	RG
Wilson F. Erskine, Master	OSS, Coastwise, any GT	O
George W. Veitch, Chief Mate	OSS, any GT	RG
Alfred H. Stephens, Chief Mate	OSS, any GT	RG
Charles L. Sauerbier, Chief Mate	OSS, any GT	RG
Earl E. English, 2nd Mate	OSS, any GT	O
William S. Dodge, 2nd Mate	OSS, any GT	RG
Albert N. Miller, 2nd Mate	OSS, any GT	O
Kenneth S. Terrill, 3rd Mate	OSS, any GT	O
Clifton A. Olver, 3rd Mate	OSS, any GT	O

Abbreviations: GT is gross tonnage; RG is raised grade; O is original license; OSS is ocean steamer; OMS is ocean motorship.

personal appearance of the officers. Men that are careful of their ships are usually careful of themselves, and it is something of a matter of pride on many vessels that this be kept up at sea as well as when the vessel gets into port.

The management of any line is proud to see a well kept vessel and is prouder still to see officers on that vessel that are a credit to the vessel, no matter what port she may enter.

Some men wonder why they do not get along as fast as others, and you may be assured that if there are two men with equal qualifications, the one that is careful of his dress and presents the best appearance will be the one that gets the breaks. Not only that but the one who takes advantage of the spare time he has at sea to improve himself in as many ways as he can will eventually have a great advantage over less industrious shipmates.

Editorial Note: — The editor in charge of this section of Pacific Marine Review is an experienced shipmaster. He will be glad to answer questions or to advise on helpful courses of reading and study for deck officers.

Literature of the Industry

(Continued from Page 30)

joints and fittings; plan of construction; shop and field fabrication; and piping erection.

Turbine Pumps, bulletin 260-B11C issued by the Roots-Connersville Blower Corporation, describes the line of turbine pumps manufactured by that corporation.

These pumps are offered in bronze-fitted, Tempaloy-fitted, all-iron, and all-Tempaloy bronze. Special pumps of Monel, stainless steel, or other alloys can also be supplied.

The pumps described cover a capacity range from 2½ to 175 gallons per minute at heads up to 500 feet. They may be installed in any position and are adaptable to any of the standard drives.

Modern Turbines to Reduce Costs. Recent developments in higher steam pressures and temperatures, in boiler and combustion equipment, in steam turbines and in the application of exhaust and bled steam, and how these have all combined to make possible great economies in the generation of power and heat for buildings and industrial plants, is the theme of this 12-page, 11 x 16 in. brochure issued by the De Laval Steam Turbine Co.

Cheaper fuels can now be burned with less labor and with higher efficiency, and much more power can be generated from a given weight of steam than formerly.

Less building space is required, or increased demands for power can be met without increased costs for buildings and foundations.

In many cases existing equipment, if in good condition, can be retained by superposing a high pressure boiler and turbine, the latter exhausting into the present steam mains.

Engineers and owners of steam plants may study with interest and profit the great variety of steam turbine applications which are set forth in the text and illustrations of this publication.

De Laval IMO Oil Pumps, publication L-32-10, an eight-page booklet published by the De Laval Steam Turbine Company and describing numerous and varied uses of the IMO rotary oil pump.

This pump is designed to run at ordinary electric motor and steam turbine speeds and is used principally for supplying fuel oils of all grades to burners and for transferring or circulating lubricating oils.

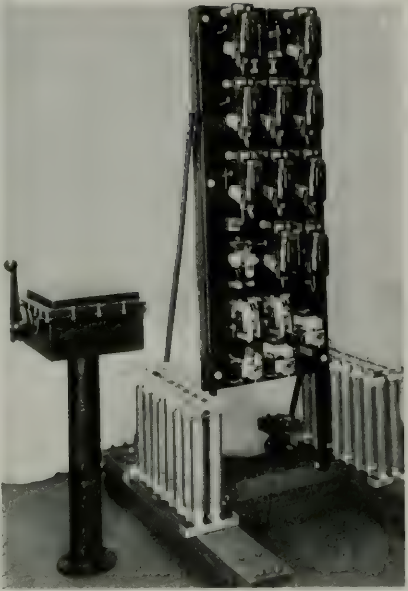
It has three moving parts, a power rotor and two sealing rotors, but no valves, timing or pilot gears or separate bearings. The one stuffing box is subject to suction pressure only.

There is no trapping of liquid pumped and pulsation or vibration is absent. The applications shown

(Page 39, please)

1937 Marine Electrical Developments Reviewed

By H. C. Coleman
Manager Marine Electrical Engineering, Westinghouse Electric and Manufacturing Company



New controls for 35 H.P. cargo winch motor.

The gradual upward trend in merchant shipbuilding which began in 1935 after several slack years, and showed a marked increase in 1936, continued to advance at about the same rate during 1937. As might be expected, this increase in shipbuilding activity has resulted in a considerable growth of the application of electrical equipment to marine use.

Since 1919, when the first installation of the diesel electric system of propulsion in this country was made, there have been few years which did not see such a plant used on a new class or type of vessel. The year 1937 has been no exception to the general rule, for during this period three entirely new types have been added to the already long list.

● Interesting Dredge.

The first pipeline suction dredges to utilize the diesel electric propulsion system were placed in service about the middle of the year. These dredges, the Wm. A. Thompson and Rock Island, were built for the U. S. Army, Engineer Department, for use in maintaining channels on the Mississippi River. These vessels are 230 feet long with a 48 foot beam and 8½ foot deep hulls. Each dredge has two diesel generating sets which supply power to two 500 H.P. propelling motors which are used when moving the dredge from one location to another. When dredging, the diesel generating sets supply power to the 300 H.P. cutter motor and other auxiliaries. A modern dead front switchboard controls the generating plant and distribution.

● First Electrically Propelled Mine Planter.

The first electrically propelled mine planter was delivered to the U. S. Quartermaster Corps late in the year. One of the primary reasons for selecting electric drive was because of the necessity of extremely accurate maneuvering when laying mines. The diesel electric system worked out to the best advantage for this installation. The vessel is propelled by twin screws, each driven by a 560 H.P., 230 r.p.m. single armature motor. The prime movers consist of three 600 H.P. diesel engines. Two of these engines drive single armature 300 k.w. main generators and 100 k.w. auxiliary generators, operating at 400 r.p.m. The three generating sets are located abreast of each other and the middle engine drives a double unit main generator, each unit developing 150 k.w., and a 100 k.w. auxiliary generator. This arrangement enables the load of the two propellers to be divided between the three main engines and gives the greatest flexibility of power both for propulsion and auxiliaries.

A great deal of care was given to the design of the control equipment, using the variable voltage system to obtain the refinement necessary on this application. The main control board, which is of the latest dead front type, provides for armature and field connections for various combinations of the main generators, propelling motors, cable reel motors and auxiliary generators. Control of the propulsion motors is obtained from an elaborate control station in the pilot house with extensions on the flying bridge. Control may also be had at the engine room control board.

● Hyacinth Destroyer.

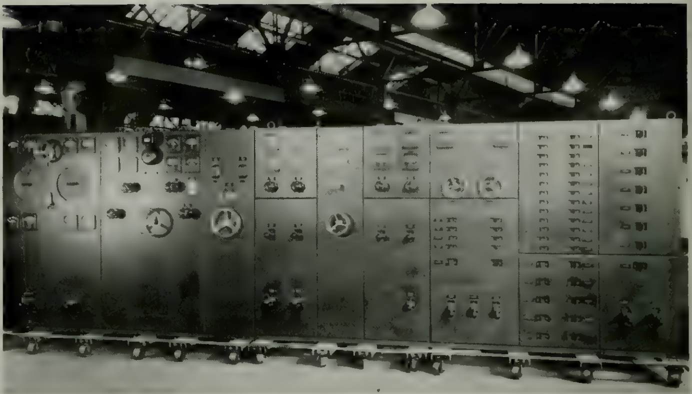
A very interesting and unusual installation, though small, using the diesel electric propulsion system was made on a boat designed by the U. S. Engineer Dept. at New Orleans for the purpose of destroying water hyacinths. These hyacinths infest many of the tributaries and bayous of the Mississippi River and are a serious menace to navigation. For many years the U. S. Engineer Dept. has endeavored to control this pest by spraying with special boats, using an arsenic solution. This method is dangerous, not only to the crews of the boats, but to the livestock along the rivers. After considerable effort the new hyacinth destruction boat Kenny was designed and built and is now in operation.

The boat is propelled by twin screws, each driven by a 25 H.P., 450/1800 r.p.m. propelling motor. Power is supplied by two 80 k.w. diesel generating sets. These generators also supply power to a 20 H.P. motor driving a 15 foot wide conveyor at the bow of the vessel, a 50 H.P. motor driving a crusher, a 20 H.P. motor driving a flushing pump and other small auxiliaries.

The boat is propelled slowly through the hyacinth beds, and the plants are caught on the inclined conveyor, which extends about two feet below the water line, and are carried to a large hopper directly over the crusher. They fall into the crusher, which consists of two heavy steel drums with cutters revolving together. After passing through the crusher the material is flushed overboard and sinks to the bottom. If this experimental boat works out satisfactorily, as present operation indicates it will, additional units will be built so that the old method of spraying may be abandoned.

● First Two-Screw Diesel Electric Ferry.

The first twin screw diesel electric ferry with complete individual control on the propellers from either of two main engine generator sets, utilizing double unit generators, has been placed in service by the Algiers Public Service Company of New Orleans. The boat is propelled by two 250 H.P., 180 r.p.m., single armature motors, and power is supplied by two diesel generating sets, each consisting of a 350 H.P., 400 r.p.m. engine direct connected to a double armature propulsion generator, 105 k.w., 125 volt per armature, and a 30 k.w., 125 volt exciter. The switchboard is of the completely dead front type. It is in one unit, combining the engine room control station for the propelling motors, generators and control of all auxiliary power and lighting circuits. The variable voltage control system is used and the circuits are so arranged, when propelling with both main engines, that one generator unit of each engine is connected to one propelling motor. Thus the load is always equally divided between the engines. When operating with only one main engine, the double unit generator provides for complete individual control of the two propelling motors. Complete pilot house control is provided.' This ferry is able to carry about 35 per cent more pay load than the present steam ferries, though it is no larger, and its operating cost will be considerably less.



Main control board for diesel electric mine planter Ellery W. Niles.

● Panama Canal Tug.

Complete diesel electric propulsion equipment was furnished for a tug for the Panama Canal. This equipment consisted of two 350 k.w. 300 r.p.m. main generators and 60 k.w. exciters, a propelling motor of the double armature type rated at 750 H.P., 120 r.p.m. with a maximum rating of 900 H.P. for two hours, and a complete dead front type control board, using the variable voltage system with pilot house control. The main features of this equipment consisted of the compact dead front control boards and the specially arranged ventilating scheme for the propelling motor, designed so as to obtain 80 per cent of the normal rating with the induced draft fan not operating and without exceeding normal temperature rises.

● New York's Fireboat.

The design and manufacture of diesel electric propulsion and pumping equipment for the largest fireboat for the City of New York was started during the latter part of the year. This boat will have two 1500 H.P. diesel engines driving main and auxiliary generators which will supply power to two 1000 H.P. propelling motors and four 600 H.P. fire pump motors.

● Ship's Auxiliaries.

Many installations of ship's auxiliaries have been made during the year. One of these consisted of all of the many deck and under-deck auxiliary motors and controllers on the new U.S. Engineer Dept. seagoing hopper dredge Goethals, the largest dredge of this type in the world. Another interesting installation for which the equipment is now being built is the complete auxiliary motor and control equipment for three combined passenger and cargo vessels being built by the Bethlehem Shipbuilding Corporation for the Panama Railroad Steamship Company. This installation will include, for the three ships, 24 35 H.P. single geared cargo winch equipments and 12 35 H.P. compound geared winch equipments with the latest type of motors and improved control.

During the year a great deal of work has been done in connection with the extensive Navy building program in the way of furnishing electrical equipment of all types.

● New Shipbuilding.

Much new ship construction appears necessary in the immediate future to strengthen our merchant marine. The Maritime Commission is proceeding with its plans to that end. Many tankers and small craft will be built as well as special ships for various Government branches. The extensive Navy building program now under way will no doubt be continued. Thus the outlook for the shipbuilding industry and all its related activities for 1938 is very favorable.

Coordinating Air and Surface Overseas Transport

Proposed American Transport Lines Transatlantic Expansion Program

The minute Congress acts to free verseas flying from the giant monpoly transoceanic aviation is headng into, American Export Lines will lace orders for new equipment toaling more than $25,000,000, which ill include a fleet of long range lying boats sufficient in number to perate two non-stop transatlantic chedules a week.

This statement was made to memers of Congress in a letter mailed ecently by W. H. Coverdale, presient of the steamship line, which perates passenger and freight teamship services under the Amerian flag to fourteen European counries.

"It is clear to us that under our xpansion and modernization proram looking towards the most useul and economic transportation, we ill have to build a certain number f new steamships to handle freight nd reasonably priced passenger raffic, and at the same time build sufficient number of long range lying boats to carry passengers, oods and mail that must have peedy transportation," he said, "but e cannot do this if we are excluded rom the use of flying boats, and heir operation is allowed to be monpolized by one single overseas air ervice."

Pointing to sections of the McCarran-Lea Bill, Coverdale's letter ontinues, "We do not believe that it s the intention of the proponents of his legislation to stunt the development of American overseas flying by esting it in the hands of one existng air company, to the exclusion of nother American company that also as, or may show, its interest in this ype of service. We are assured by ompetent authority that provisions n this bill, and similar provisions in the Air Mail Bill, if enacted into a law, would create the tightest kind of monopoly that any form of transportation has ever witnessed."

Coverdale said that he referred particularly to Section 305(K) of the McCarran-Lea Bill, which proposes to put the regulation of foreign air transportation under the Interstate Commerce Commission, and provides that if any person applying for a certificate for foreign air transportation holds an interest, license, permit, or franchise at the date of passage of the bill, this person shall be given preference in the issuance of a certificate over any other applicant.

Citing the rapid growth of domestic air lines, he calls upon Congress to "imagine how our domestic air service would have been stunted if it had started out with legislation designed to make a monopoly of it. We probably would have had one transcontinental service instead of four, and would not have had the superior service and equipment brought about by active competition which has put American domestic air transportation ahead of all other countries."

The question of regulation, control and protection of overseas flying in order that it may be established on a permanent basis under some reliable and responsible commission or department is also cited in his letter as another unsettled question which is preventing the flow of capital into the development of transatlantic flying.

"It would seem logical that the same commission that has jurisdiction over domestic ground transportation should regulate domestic air transportation, and likewise the same commission that has jurisdiction over the American Merchant Marine should have jurisdiction over foreign or overseas air operations," he said. "We believe that the development of overseas flying should be placed under the Maritime Commission or at least under a commission that would be closely liaisoned, because our observations clearly indicate that the flying boat can be most successfully developed if it is operated in conjunction with, and as an integral part of, our Merchant Marine."

American Export Lines is the first American transatlantic steamship company to announce plans for supplementing its steamship services with flying boat operations. It operates a fleet of 18 steamships under the American flag to 73 ports in 14 foreign countries. It is the largest American cargo carrier under the American flag crossing the Atlantic, and was one of the first companies to build combination freight and passenger ships following the passage of the Maritime Marine Act of 1929.

Coverdale said company engineers and transportation experts have been engaged for the past year and a half in an international survey throughout France, Italy, Portugal, and Spain, and other countries touching the Mediterranean and Black Seas, for the purpose of arriving at a basis for expansion and modernization of equipment. The American Export Lines is the first American company to express the belief that giant flying boats can carry most of the mail, passenger and express business of a steamship line, leaving the freight, and passengers with more leisure time, to move on more economically operated combination freight and passenger vessels.

Reconditioning

Moore Dry Dock Co. Renews Interior of Standard Oil Tanker S.C.T. Dodd

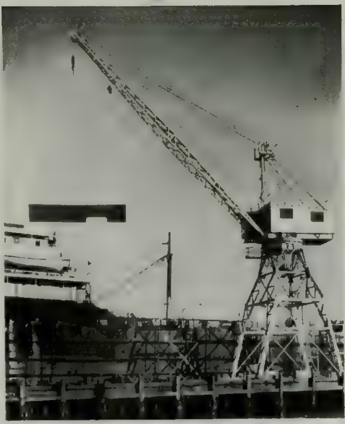
As a routine item in their maintenance program the Standard Oil Company of California recently decided to recondition the tanker S. C. T. Dodd.

This vessel is 425 feet long, has a beam of 57 feet, is 33 feet 0 inches deep, and is driven by triple expansion engines direct connected to a single screw. Steam is supplied by three single-ended Scotch marine boilers. Her cargo capacity is 79,922 barrels of oil. Her deadweight capacity is 10,509 tons on 27 feet 3¼ inches draft.

She was built at the yards of the Moore Shipbuilding Company—now the Moore Dry Dock Company—Oakland, California, for the Standard Oil Company in 1920, and back to her birthplace she came for reconditioning.

Renewals to the hull structure involved practically all of the interior members in the way of the cargo oil tanks. Within these spaces every bit of material deteriorated by corrosion was removed and replaced with new steel. Approximately 1000 tons of new steel was used in this work.

Taking this amount of steel out of the strength members of a ship's hull involves major problems of maintaining the strength and the alignment of the structure during the process. Solution of these problems lies in the procedures of cutting out and replacing. The Dodd had nine main cargo tanks each divided into two compartments by a center line bulkhead, and five summer tanks arranged above the second deck. The procedure adopted was to first cut out the second deck and the bulkheads forming the summer tanks, together with all stiffenings, transverse webs, and longitudinals, and then to replace with new steel and rivet all of these members before proceeding with work on the balance of the structure. This was found very satisfactory.



Cranes are a very important factor in shipbuilding or ship reconditioning operations. The two illustrations above show two of the portal, revolving jib cranes at the Moore Dry Dock plant.

In the upper picture the crane is hoisting out the foremast of the tanker S. C. T. Dodd. In the lower view the crane is spotting a large plate.

Eleven transverse bulkheads with all their stiffening webs were renewed. The forward pump room and its cofferdam were eliminated and the space formerly occupied by these compartments was included in No. 1 cargo tank. A new transverse web was substituted for the bulkhead which had been the after boundary of the forward cofferdam. The entire center line bulkhead, with the exception of a short length in the midship pump room, was renewed and all shell and upper deck longitudinals within the oil cargo tanks.

For access to the work it was necessary to remove a considerable amount of upper deck plating. All such plates were replaced with new material.

A Pacific Coast Tanker

The hull and all structural work on the vessel was done under the supervision of Mr. Harry Fawke, hull superintendent of the Moore Dry Dock Company.

All this renewal work was done in accordance with the latest requirements of the American Bureau of Shipping for this type of vessel.

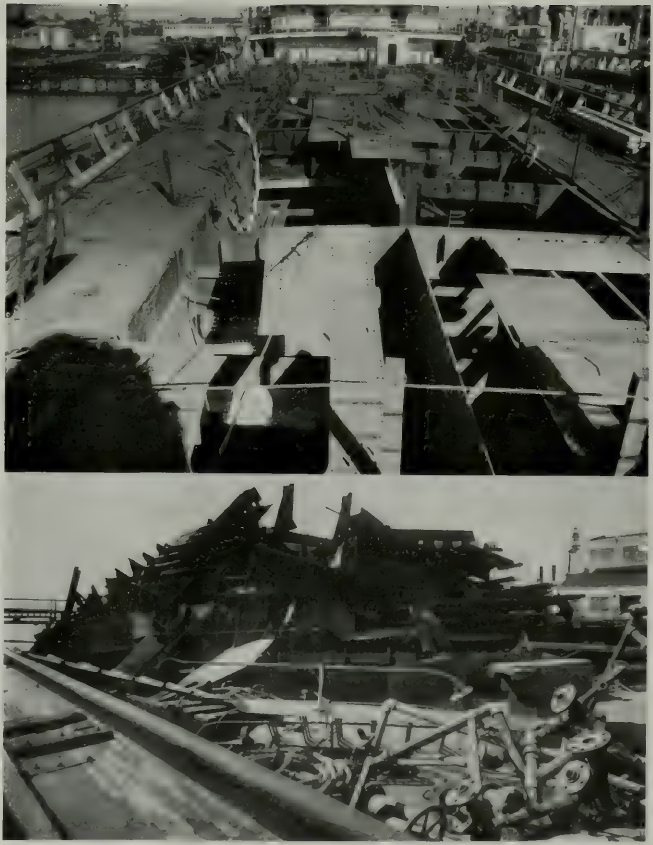
All the piping systems in connection with handling oil cargo were overhauled and were renewed where necessary.

Officer and crew accommodations, including galley and mess rooms, were rearranged and modernized. Hot and cold water were piped to all rooms. A system of mechanical ventilation was installed, capable of changing the air in all of the crew's quarters once every four minutes. The electric system was completely overhauled and largely renewed. All of the old piping systems in way of crew's quarters were overhauled and renewed where necessary. This work in the crew accommodations was all installed in accordance with the new rulings of the Bureau of Marine Inspection and Navigation.

In short, the tanker S. C. T. Dodd is now practically a new ship ready for many years of useful service.

Trade Literature

High Strength Corrosion Resisting Rivets for Marine Construction, bulletin 2M-10-37 of the International Nickel Company, Inc. This 10-page illustrated booklet describes and illustrates the advantages of using nickel steel rivets in the shell plating of ships to save maintenance expense and secure stronger joints.

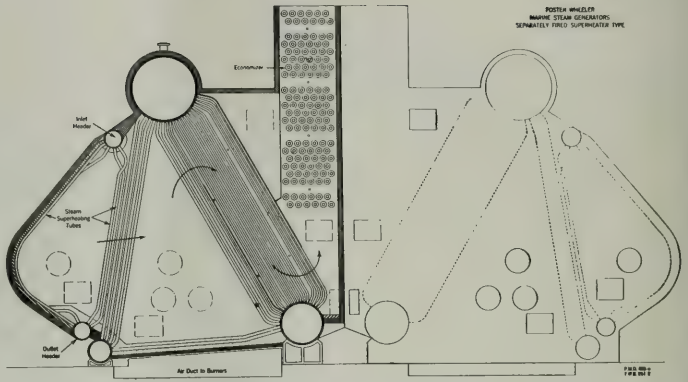


The illustrations above give some idea of the way in which the hull of the tanker S. C. T. Dodd was opened up to get at the work of renewing her interior frame, and also of the amount of old material removed from the hull.

The upper view shows the main deck of the tanker with plates removed for access. All plates removed were replaced with new material.

The lower view shows a portion of the steel plates and shapes, the piping and other materials removed from the hull. This material weighed approximately 1000 tons.

New Type *Marine Steam Generator*



A battery of two Foster-Wheeler steam generators of the separately fired superheater marine type.

The steam requirements of the Tide Water-Associated tanker, now building in the Sun Shipbuilding Yard at Chester, New Jersey, will be provided by two marine steam generators set in a battery and enclosed in a steel casing. These steaming units are of a type known as the "separately-fired-superheater" design. This is a modification of the "A"-type marine steam generator, many of which have been fitted to merchant vessels built on the Atlantic seaboard during the last five years.

There are three outstanding differences between the separately fired superheater type and the "A"-type heretofore used. First, there are no water walls used in the new design, as the boiler tubes are carried down to the furnace floor. Second, an economizer is placed at one side of the boiler only and all of the gases pass out at one side instead of leaving in equal volume from both sides. Third, the final steam temperature is secured through the use of a separately fired superheater worked into the design of the boiler on the side opposite the economizer. The superheater and its independent furnace are included in the boiler setting. A single casing used in this way eliminates any appreciable increase in radiation losses that might attend the introduction of a separately fired superheater on shipboard.

In modern steam turbine drives the efficiency depends largely upon the maximum steam temperature available. This in turn depends upon the fluctuations in superheat that must be expected when all conditions of service are taken into consideration. The turbine builder will guarantee performance at a certain maximum, but cannot accept responsibilitiy for temperatures in excess of that. The boiler builder must, therefore, set his maximum to correspond with the maximum of the turbine builder, and with certain designs in the past a liberal allowance was necessary, since the superheat was apt to rise suddenly under certain conditions of maneuvering and unexpected reduction in steam requirement.

A further complication as regards tank steamers is the supply of saturated steam for operating cargo pumps and tank heaters. It has been usual practice to add desuperheaters, with unavoidable complication in the steam drum and attendant possibilities of leakage from the steam drum into the desuperheated line.

It has long been recognized that a separately fired superheater provides a most positive and flexible control of final steam temperature and there are many instances of such applications in stationary work. The new marine boiler embodies all the advantages of separately fired superheater control without the addition of another piece of boiler room equipment, its complications, reduction in efficiency and space occupied.

Referring to the specific design for the Associated Oil Company, it will be seen from the drawing that the main boiler furnace may be operated at any rating desired for the production of steam and that all gases will pass out through the main bank of boiler tubes and the economizer. Saturated steam in any amount up to 50,000 lbs. of steam per hour may be produced in this manner.

Any desired amount of steam may, at the same time, be passed through the separately fired superheater and heated to the desired final temperature, under absolute control, by firing the superheater furnace at the necessary rate. The superheater is capable of handling 35,000 lbs. of steam per hour at temperatures up to 750 deg. F. The normal operating condition is 17,500 lbs. of steam per hour from each boiler at about 400 lbs. pressure and 750 deg. F.

The gases from the superheater furnace pass across two rows of superheating tubes and four rows of boiler tubes into the main furnace, where they mix with the gases from the burners of the main furnace and pass out through the main bank of boiler tubes and the economizer. Thus the heat from the gases leaving the superheater furnace is absorbed in steam generation at the same efficiency as the main boiler.

It will be noted that the boilers are modern and up-to-date in all points of construction, having water cooling tubes below the floor of the furnace and an air jacket around the furnace to recover heat lost by radiation.

Before passing to the details of construction, it may be interesting to note that this design of marine steam generator has already been built in a somewhat larger size and officially tested over a wide range of ratings up to 170,000 lbs. of steam per hour. Excellent performance was obtained and the present boilers are the result of the experience gained in this work, which covered many months of operating under the extreme variety of conditions.

Each of the new steam generators will have 3,000 sq. ft. of boiler surface, and 2,970 sq. ft of economizer surface, giving a total of 5,970 sq. ft. They will be built for a design pressure of 450 lbs. per square inch. The rows of tubes adjacent to the furnace on each side will be 2 inch diameter and the balance of the boiler tube bank will be of 1¼ inch tubes. In addition to the tubes shown there will be four 3 inch downcomer tubes to assure ample circulating in the boiler at high ratings. The steam drum will be 42 inches in diameter, the main water drum 27 inches in diameter, and the small water drum 14 inches in diameter.

The economizer will be of standard cast iron extended surface armored type, having six times the area of the bare tubing per lineal foot. Todd oil burners will be used for firing the boilers, and the boilers and economizers will be maintained clean with Vulcan soot blowers. Wager smoke indicators will be applied for convenience of firemen in checking combustion.

The main and auxiliary condensers used on the steamer will be of the surface type having electrically welded steel shells and Cupro nickel tubes. The tubes will be expanded at each end to eliminate the possibility of leaks. This is essential in boilers operating at pressures of 400 lbs. per square inch, since even a small amount of contamination causes serious trouble. The condensers will be equipped with steam jet air pumps having inter and after surface condensers. The separately-fired-superheater marine steam generators and condensing equipment will be furnished by Foster Wheeler Corporation.

Literature of the Industry

(Continued from Page 32)

range from small lubricating pumps built into other machines to pumps supplying oil to hydraulic pressure systems at 500 lbs. per square inch and Bunker C oil in large quantities to burners in central stations and on large steamships.

Heat, a 48-page illustrated book published by Johns-Manville and telling "the dramatic story of man's age-old struggle to control Nature's most powerful force."

Heat is divided into five chapters for easy reference. The first chapter deals with the history of heat—early theories and discoveries concerning its nature, and the work done by those men who made possible today's highly complex industrial civilization. The accepted definition of what heat is, as well as the three methods of heat transfer, and the use industry makes of this knowledge are taken up in detail in the second chapter.

The story of what science is accomplishing in the field of heat conservation, and in the development of materials specifically designed for insulation and reduction of heat loss, is contained in the third chapter.

The fourth and fifth chapters are perhaps of most value to engineers and those interested in the subject of heat conservation. These chapters describe modern materials available for conserving heat, and the specific uses of these materials. How the economical thickness of an insulation is figured, and the reasons why certain insulations are better for one purpose than another, are discussed in detail.

Nickel Alloy Steels for Hand Tools, bulletin U-3 of the International Nickel Company Inc., is a 16-page illustrated book describing the advantages of using nickel steel alloys in various hand tools used by craftsmen in many trades. Greater strength with less weight and bulk, greater hardness with less brittleness, better ability to hold an edge in cutting operations, better ability to withstand corrosive action, are all obtainable at low cost by the use of the correct nickel steel and the correct heat treatment.

Lifeboat Handling by Welin-Maclachlan Gravity Winch, a handsome, well illustrated four-page brochure, describing the various types of winches manufactured by the Welin Davit and Boat Corporation.

At the present time, in response to the new rules requiring mechanical means of handling lifeboats, these winches are being installed on 52 cargo and passenger vessels in the American merchant marine and the U. S. Army Transport Service.

A Study of Tube Corrosion, a beautifully printed and illustrated 30-page book in black and green, published by Chase Brass and Copper Company, Inc. The first ten pages are devoted to a comprehensive account of condenser tube corrosion. The next five pages describe tube manufacture. Then follow: the American Society for Testing Materials; specifications for copper and copper alloys for seamless condenser tubes; condenser tube ferrules and methods for their installation; test practice at the Chase laboratories; Chase service experience; and the physical properties of condenser tubes.

Editorial Note:

Copies of any of the above may be obtained free on application to Pacific Marine Review, 500 Sansome St., San Francisco, California.

Improved *Iron Castings* for Marine Use

A typical iron casting by the Meehanite process.

One of the most outstanding developments in the metallurgy of cast iron during this century is the process known as Meehanite. The basic principle of this process was discovered in 1923. In the succeeding years it was developed and perfected very rapidly under the ownership and control of the Meehanite Metal Corporation. The process is completely covered and protected by United States and foreign patents.

One secret of the growth of the Meehanite process for producing iron castings of superior merit is the care that has been used by the parent corporation in selecting foundry representatives as licensees to manufacture such castings. We are informed that there are less than fifty such licensees, and that each of them must hold membership in and contribute to the Meehanite Research Institute, which pools all technical data, carries on research work, and acts as an information bureau to distribute all the technical data to each licensee. The Vulcan Foundry of Oakland, California, is licensee for the Central California District, and Thomas A. Short, successor to C. V. Lane, represents this foundry in marine sales.

Specifically, the Meehanite process controls the metallurgical phenomena which govern the crystalline form of the graphite and the matrix in cast iron. The result of this control is a close grained casting whose physical characteristics are uniform throughout the mass and exactly meet the desired specifications.

When casting operations are controlled by this process, the designer of machinery can depend on every square inch of section carrying its proper share of the load imposed.

Another advantage of Meehanite castings is that they respond to heat treatment in much the same way as steel. Heating and quenching hardens these castings; cooling slowly in the furnace softens them; quenching followed by a drawing treatment increases their strength and toughness.

Cast iron, under the various Meehanite processes and controls, may be made into perfectly uniform castings having physical properties ranging from those of the best gray iron castings to those comparable, and in some items much superior to, cast steel.

Because of these superior characteristics Meehanite castings are recommended for all applications where wearing friction and heat are problems, such as:

Pistons, rings, liners, and cylinder heads for diesel engines;

Pistons, rings, and liners for steam engines;

Pump liners;

Turbine casings;

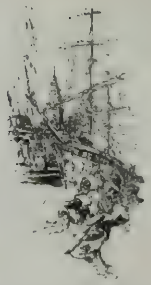
Burner cones.

An interesting application was made on the U. S. Army Engineers' dredge Pacific, recently built at the Union Plant of the Bethlehem Shipbuilding Corporation, Ltd., San Francisco. Dredges use their anchors much more frequently than most commercial ships, and wear on hawse pipes is rather abnormal. F. C. Scheffauer, Principal Engineer, U. S. Engineers' office at San Francisco, became convinced after a complete investigation of Meehanite castings that this was the answer to the hawse pipe problem. He therefore specified the two pipes for the dredge Pacific to be cast of Meehanite. These hawse pipes, weighing approximately 1500 pounds each, are now in the bow of the dredge and doing good service there.

The Vulcan foundry is in daily operation and in a position to make prompt deliveries of Meehanite process iron castings to ships. Large stocks of ring and bushing castings are on hand for immediate delivery.

On the Ways—

SHIPS IN THE MAKING



LATEST NEWS FROM AMERICAN SHIPYARDS

Los Angeles Shipbuilding Co. Launches Oil Delivery Barge

With appropriate ceremonies, in which a large group of distinguished persons participated, the new $110,000 oil barge of General Petroleum Corporation was launched December 18 from the yards of Los Angeles Shipbuilding & Drydock Company.

Central feature of the program was the christening performed by Virginia Woll, attractive daughter of Arthur O. Woll, marine department manager and director for General Petroleum.

The big steel hull, which has a capacity of 8,200 barrels of fuel and diesel oil, slid into the harbor in perfect form. According to mariners the launching was performed so smoothly as to indicate a successful career for the new craft, which will be used in bunkering many of the ships calling at Los Angeles harbor.

Distinguished personages in attendance included: Eloi J. Amar, president of the Harbor Board; Otto Miller, deputy collector of customs; Arthur Eldridge, harbor board general manager; A. L. Woodruff, shipping commissioner; Earl C. Earle, harbor engineer; Captain C. C. Spicer, chairman of the board of Los Angeles Shipbuilding & Drydock Company; Roy Beaton, acting harbor master; George Sutherland, superintendent of the shipyard; and representatives of all the oil companies having interests in Los Angeles harbor.

Among those present from General Petroleum Corporation were: Arthur O. Woll, manager of the marine department; Lloyd Moore, assistant marine department manager; A. L. Knipping, operating department manager; N. H. Marsh, manager of export sales; A. D. Bennison, manager of fuel oil sales; W. B. Pyles, manager of transportation; and Fred Maurer, who will manage the operation of the new craft.

The new Genpet barge is 139 feet long, with beam of 40 feet and depth of 14 feet. Pumping outfit consists of two 100-horsepower Enterprise 4-cylinder full-diesel engines, of heavy-duty, stationary type. They are complete with air tanks, spark arresting silencers, mufflers, attached cooling water pumps, fuel and

A christening and a launching—the sponsor, Virginia Woll; the hull, General Petroleum Barge No. 3.

fuel transfer pumps, and air compressors.

Both engines are connected separately with either of two Kinney Heliquad rotary-type pumps of 73,500 gallons capacity per hour each. Auxiliaries include bilge pump, generator, auxiliary engine with muffler, and auxiliary air compressor.

Federal Yard Busy

The Federal Shipbuilding & Dry Dock Company delivered destroyer No. DD381, christened Sommers, to the U. S. Navy on November 30. Keel for this vessel was laid June 27, 1935. She is of 1850 ton displacement.

This yard also delivered the Esso Bayway, a 12,800 ton tanker, to the Standard Oil Company of New Jersey, launched a sister tanker, Esso Houston, for the same owners on the 18th of December, and laid a keel for a similar tanker for Pan American Petroleum & Transport Company on the 15th of November.

Two Special Barges

The Ingalls Iron Works, Birmingham, Alabama, delivered a vegetable oil barge to the New York Tank Barge Company of New York on December 10. This barge is 195 feet by 42 feet by 12 feet and has a capacity for 1250 tons.

On January 1, 1938, this firm delivered a 35-ton whirler derrick barge to the U. S. Engineers at Huntington, West Virginia.

Fore River Gets Two More Destroyers

The Fore River plant of the Bethlehem Shipbuilding Corporation Ltd. has been awarded a contract to build two destroyers for the U. S. Navy. These are 1500 ton displacement class and are now known as hull order numbers 1470 and 1471. Delivery dates are estimated to be in March and May of 1940.

Taken from Federal Shipbuilding & Dry Dock Co. Christmas card which symbolizes the flow of tankers from their ways.

Sparrows Point Launches Tanker

On December 11 the second of two tankers building at the Sparrows Point Yard of the Bethlehem Shipbuilding Corp. Ltd. was christened Gulfdisc and launched into the waters of Chesapeake Bay.

The second of four tankers for the Standard Oil of New Jersey is to be christened R. W. Gallagher and launched on January 22, 1938.

Texas Yard Busy

The Levingston Shipbuilding Co. of Orange, Texas, is busy on all welded work craft construction. They report delivery of one towboat and three barges during December. The towboat is one out of two being built for the Pan American Petroleum & Transport Co. Each of these tugs is of all welded steel construction, 64 feet 11 inches long, 18 feet beam, and 7 feet 6 inches molded depth, and is equipped with a 380 B.H.P. Atlas Imperial diesel engine. Two barges were for Standard Oil Company of Texas and one for Shell Petroleum Corp.

Diesel Electric Tanker Launched

On December 8 a diesel-electric tank vessel for the Standard Oil Company of New Jersey was launched at the yards of the Newport News Shipbuilding & Dry Dock Company at Newport News, Virginia. This tanker is 260 feet 6 inches long, 43 feet 6 inches beam, and 18 feet 3 inches deep.

Keels for two destroyers were laid at this yard during December. Work on hand in addition to above includes the big passenger and express transatlantic liner for the United States Lines; and for the Navy, an airplane carrier and two light cruisers.

Submarine Commissioned

Portsmouth Navy Yard reports delivery and commissioning on December 15 of the U. S. Submarine Snapper. This "sub" is of the 300 feet length class. Her keel was laid July 23, 1936. Five other submarines are under construction, with estimated completion dates up to April 1, 1940.

United Launches and Delivers

United Shipyards Inc., on Staten Island, N. Y., was a very busy place last month.

On December 2 they launched the last of three ferries for the City of New York. On December 18 they delivered the first of these ferries, and they will deliver the 2nd and 3d on January 18 and February 21, 1938.

On November 22 they launched the first of three sludge vessels for the City of New York, and on December 29 delivered her.

On November 12 and December 3 they delivered two large oil barges to the Standard-Vacuum Oil Company.

First of the California Tankers

Above: The W. S. Berg on ways ready for launching. Below: Mrs. W. S. Berg ready for christening act.
At right: W. S. Berg after the launching, and the California party at the launch—Mr. and Mrs. W. S. Berg and J. H. McEachern.

On December 14, 1937, Mrs. W. S. Berg, wife of the new president of the Standard Oil Company of California, very neatly broke a bottle of California champagne over the bow of Hull No. 166 at the Chester plant of the Sun Shipbuilding & Dry Dock Co., and lovingly pronounced the words, "I christen thee W. S. Berg." The vessel thus named slid gracefully into the waters of the Delaware River and was towed to the outfitting dock for completion. J. H. McEachern, manager of the Marine Department, Standard Oil Company of California, was present at the launching.

This ship is the first of two tankers building at the Sun yard for the Standard Oil Company of California. She will be finished and on her way to the Pacific Coast before this article is off the press, and is expected to arrive at San Francisco about the 20th of January. A full illustrated description will appear in Pacific Marine Review for February, 1938.

Building in American Yards

Pacific Coast

BETHLEHEM SHIPBUILDING CORPORATION, LTD.
(Union Plant)
San Francisco

NEW CONSTRUCTION: **Hull 5355—McCall (DD400).** Launched November 20, 1937; completion date March 1, 1938. **Hull 5356—Maury (DD401);** completion date June 1, 1938. Two 1500-ton destroyers for U. S. Navy; length, 341′ 3⅝″; beam, 35′ 6⅛″; depth, 19′ 8″. Cost $3,675,000.

DRYDOCK AND ROUTINE REPAIRS: **Frank G. Drum, M.S. Richlube, Manatawny, President Pierce, Chiriqui, J. A. Moffett, President Hoover, Cuzco, M.S. Hermion, M.S. Bralanta, Capac, U.S.S. Idaho, Antigua, Talamanca, U.S.S. Mississippi, Barge Bay Gull, Makawao, Absaroka, Coya, President Cleveland.**

FELLOWS & STEWART, INC.
Wilmington, Calif.

NEW CONSTRUCTION: **Contract No. 663. 65 foot pleasure fishing boat** for charter. Main engine Fairbanks-Morse, with two Ford V8 conversions for auxiliary power.

Contract No. 644, 65 foot combined passenger and party boat.

DRYDOCK AND ROUTINE REPAIRS: **Large yachts Novia del Mar, Katinka, Cacholot, and Joyita; small freighter Joanne; fishing boat Amano; glass bottomed boats Torqua and Cleopatra; 42 smaller yachts and commercial boats.**

GENERAL ENGINEERING & DRY DOCK CO.
Foot of Fifth Avenue
Oakland, Calif.

DRYDOCK AND ROUTINE REPAIRS: **Svea, L.H.T. Columbine, Carfloat Santa Fe No. 3, American Fisher, Makawao, Barges Nos. 55 and 200, Lake Miraflores, Gas. S. Advance, City of Seattle, Kailua, Manini, Ryder Hanify, Josephine Lawrence, Scotia, Malama.**

HARBOR BOAT BUILDING CO.
Berth 264—Fish Harbor
Terminal Island, Calif.

NEW CONSTRUCTION: **One 80′ U. S. Coast Guard patrol boat;** 1,600 H.P.; Liberty-Vimalert conversion; speed 30 m.p.h. **Launched December 8; delivered December 15, 1937.**

HONOLULU IRON WORKS
Honolulu, T. H.

DRYDOCK AND ROUTINE REPAIRS: **Buffalo Bridge, Fort Armstrong, M.S. Hawaiian Standard, Western Ho Maru, M.S. Trade Wind, M. S. Aorangi.**

LAKE WASHINGTON SHIPYARDS
Houghton, Wash.

DRYDOCK AND ROUTINE REPAIRS: **Yacht El Primero.**

LOS ANGELES SHIPBUILDING & DRY DOCK CORP.
Los Angeles Harbor
San Pedro, Calif.

NEW CONSTRUCTION: **Hull No. 57,** one steel harbor barge 139′ x 40′ x 14′; 8,200 bbl. capacity; for General Petroleum Corp. of Calif. **Delivery date, January, 1938.**

DRYDOCK AND ROUTINE REPAIRS: **W. S. Rheem, M. V. Havbor, G. P. Barge No. 6, Tug Lebec, A.O. Barge No. 6, Yacht Volador, Mojave, Yacht Seaward, M.V. Thorhild, Kishacoquillas, Topila, Edwin B. De Golia, Argyll.**

MARE ISLAND NAVY YARD
Mare Island, Calif.

NEW CONSTRUCTION:

Pompano (SS181) submarine; keel laid January 14, 1936; launched March 11, 1937; **delivered December, 1937.**

Sturgeon, Submarine (SS187); keel laid October 27, 1936; estimated delivery September, 1938.

Swordfish, Submarine (SS193); keel laid October 27, 1937; estimated delivery date August 1, 1939.

Order received for construction of two harbor tugs October 7, 1937.

DRYDOCK AND ROUTINE REPAIRS: **New Orleans, Indianapolis, Tracey, Preble, Pruitt, Borie, Perry, Trever, Wasmuth, Zane, Ortolan, Oglala, Cuyama, Quail, Lark, Whipporwill, Porpoise, Nautilus, Pike.**

THE MOORE DRY DOCK CO.
Oakland, Calif.

DRYDOCK AND ROUTINE REPAIRS: **Montanan, Daphne, Blue Water, Lena Luckenbach, J. L. Luckenbach, Nebraskan, Crockett, Watsonville, Water Barge No. 30, Patterson, Indianan, Kentucky, Kansan, Delta Queen, Manoa, Columbian, Munami, Skipsea, Dakotan, General Sherman, Tacoma, Tug Fearless, Dinteldyk, West Nilus, Lillian Luckenbach, Bengalen, Vermont, Standard Oil Barge No. 11, Delwarian, Utahian, Granville, S. C. T. Dodd, A. Mackenzie, Panaman, Western Pacific Barge No. 2, Arizonian, Georgian, Santa Fe Barge No. 8, Oregonian; Purse seiners New Ambassador, Genevieve H-2, El Commodore, Jeannette, New Washington, Varsity, Robert B., Margaret F., Maria, J. B. Edwards, Sea Lion, Montara, Vashon, Midnight Sun, Martindale, New Saturnia, United, Coolidge No. II, Challenger.**

THE PUGET SOUND NAVY YARD
Bremerton, Washington

NEW CONSTRUCTION: **U.S.S. Jarvis** (Destroyer No. 393); standard displacement, 1500 tons; keel laid August 21, 1935; launched May 6, 1937; commissioned October 27, 1937; **completed December 1, 1937.**

U.S.S. Wilson (Destroyer No. 408); standard displacement, 1500 tons; keel laid March 22, 1937.

Destroyer No. 428; standard displacement 1600 tons; order placed by Navy Department December 7, 1937.

DRYDOCK AND ROUTINE REPAIRS: **Maryland, Utah, Ranger, Northampton, Pensacola, Minneapolis.**

TODD SEATTLE DRY DOCKS, INC.
Harbor Island
Seattle, Wash.

DRYDOCK AND ROUTINE REPAIRS: **M. S. Norco, Dorothy Luckenbach, Susan V. Luckenbach, William Luckenbach, Latouche, M. V. General, M. S. Northland, Horda.**

WESTERN BOAT BUILDING CO., INC.
2505 East 11th Street
Tacoma, Wash.

NEW CONSTRUCTION:

Hull No. 130, purse seine fishing vessel 81 x 20 x 9.5 ft.; powered by 200 H.P. Atlas 6 cylinder diesel. Keel laid October 10, 1937.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY
Pittsburgh, Pennsylvania

NEW CONSTRUCTION:

One floating machine shop for C. C. Hunley, Cairo, Ill.; 82' x 20' x 3½'.

THE AMERICAN SHIP BUILDING COMPANY

Cleveland, Ohio

NEW CONSTRUCTION: **Two bulk lake freighters** 610' x 60' x 32' 6"; 2,000 I.H.P. geared turbine, water tube boilers, 400 lbs. pressure, electric auxiliaries; for Pittsburgh Steamship Company. Keels laid June 21, 1937; and July 6, 1937; **launching dates** November 10 and **December 2, 1937;** delivery date April 15, 1938.

BATH IRON WORKS

Bath, Maine

NEW CONSTRUCTION: Hulls Nos. 161, 162, and 163; **DD394 Sampson, DD395 Davis** and **DD396 Jouett;** Three 1850-ton destroyers for U.S. Navy; date of contract September 19, 1935. Estimated delivery dates June, August and October, 1938, respectively; launching dates indefinite; **DD396,** keel laid, Mar. 26, 1936. **DD395,** keel laid July 28, 1936. **DD394,** keel laid April 8, 1936.

Hulls Nos. 170-171, DD409, Sims, and DD410, Hughes, two 1500-ton destroyers for U. S. Navy; contract date October 12, 1936; keels laid July 15 and September 15, 1937, respectively; launching dates, indefinite; delivery dates April, 1939, and June, 1939, respectively.

Hulls Nos. 177 and 178, DD423 and DD424, two 1620 ton destroyers for U. S. Navy. Contract date September 30, 1937; delivery dates April and June, 1940, respectively.

BETHLEHEM SHIPBUILDING CORPORATION

Fore River Plant,

Quincy, Mass.

NEW CONSTRUCTION:

CV7, Wasp, Airplane Carrier for U.S. Government; keel laid April 1, 1936; estimated delivery, September, 1938.

Hull 1463, U. S. Army Hopper Dredge Goethals; 5000 cubic yards capacity; keel laid October 5, 1936; launched August, 1937; estimated delivery, February, 1938.

Hulls Nos. 1467, 1468, 1469, three passenger and freight steamers for Panama Railroad S.S. Co.; 486 feet x 64 feet x 38 feet 6 inches; 16½ knot speed. Keels laid October 25, 1937.

Hulls Nos. 1470 and 1471, two 1500 ton destroyers for U. S. Government; delivery dates March, 1940 and May, 1940.

BETHLEHEM SHIPBUILDING CORPORATION

Sparrows Point Plant

Sparrows Point, Md.

NEW CONSTRUCTION: **Two oil tankers**—steam—425'x64'x34' for Gulf Oil Corp.; total tonnage 7070 each; **launching dates** October 9 and **December 11, 1937.**

Four 13,000 deadweight ton steam turbine driven tankers for Standard Oil Co. of N. J.; length 442', beam 64', depth 34' 10", gross tonnage 7,600, speed 12 knots. Esso Baton Rouge launched November 13, 1937. **R. W. Gallagher launching date January 22, 1938.**

One tanker for Texas Co.; about 13,000 deadweight tons; steam turbine.

BOSTON NAVY YARD

Boston, Mass.

NEW CONSTRUCTION:

DD389, Mugford, and DD390, Ralph Talbot, two light destroyers; LBP 334'; beam 35'6"; depth 19'8"; keels laid October 28, 1935; launched October 31, 1936; **delivered December, 1937.**

DD402, Mayrant, and DD403, Trippe, two light destroyers for United States Navy; LPB 334'; beam 35'6"; depth 19' 8"; keels laid April 15, 1937; estimated delivery dates August, 1939 and October, 1939, respectively.

DD415, O'Brien, and DD416, Walke, two destroyers; LBP 341', beam 36', depth 19'8"; delivery dates indefinite.

DD425, Madison, and DD426, Lansdale, two destroyers; 341'0" x 36'0" x 19'8".

One harbor tug for U. S. Navy; 98'0" LBP x 24'0" x 13'6"; delivery date 1938.

BROOKLYN NAVY YARD

Brooklyn, N.Y.

NEW CONSTRUCTION:

CL 40, **Brooklyn,** light cruiser, L.B.P. 600'; beam 61'8"; standard displacement, 10,000; geared turbine engines; express type boilers; keel laid, March 12, 1935; launched November 30, 1936; **delivered September 30, 1937.**

CL 48, **Honolulu,** light cruiser; L.B.P. 600'; beam 61'8"; standard displacement 10,000; geared turbine engines; express type boilers; keel laid September 10, 1935; launched August 26, 1937; estimated delivery, May 1, 1938.

CL 50, **Helena,** light cruiser; L.B.P. 600'; beam 61'7¾"; standard displacement 10,000; geared turbine engines; express type boilers; keel laid December 9, 1936; launching indefinite; contract delivery, May 16, 1939.

CHARLESTON, S. C., NAVY YARD

Charleston, S.C.

NEW CONSTRUCTION:

Order placed for **one harbor tug;** LOA 124' 9", length between perpendiculars 117', breadth, molded, 28', depth, molded, 16'; keel laid August 2, 1937.

Order placed for **one harbor tug;** LOA 110' 3"; LBP 98' 0"; breadth 24' 0"; depth at side amidships 13' 6". No dates set.

Order placed for one **harbor tug;** 65 feet long.

DEFOE BOAT & MOTOR WORKS

Bay City, Mich.

NEW CONSTRUCTION:

One diesel yacht, powered by 1,000 h.p. Winton engines; 143' long, 23' beam; steel construction. For Cox and Stevens, New York, N.Y. Delivery date May 1, 1938.

THE DRAVO CONTRACTING CO.

Engineering Works Dept.,

Pittsburgh, Pa., and Wilmington, Del.

NEW CONSTRUCTION:

Hulls Nos. 1432-1434; three welded oil barges 195' x 35' x 9' 6"; for stock; 1467 gross tons.

Hulls Nos. 1435-1439; five type W-4 welded steel coal barges 175' x 26' x 10'8"; for stock; 2360 gross tons.

Hulls Nos. 1440-1444; five type W-4 welded steel coal barges 175' x 26' x 10'8"; for stock; 2360 gross tons.

Hulls Nos. 1446-1448; three maneuver boat hulls for U. S. Engineer Office, Louisville, Ky.; 219 gross tons.

Hulls Nos. 1449-1452; four welded steel oil barges 195'x35'x9'6" for stock; 1956 gross tons.

This makes a total of 20 hulls with a total gross tonnage of 8362 tons.

ELECTRIC BOAT CORP.

Groton, Conn.

NEW CONSTRUCTION:

Hull No. 26, Salmon, SS182, standard displacement 1450 tons; keel laid April 15, 1936; launching date June 12, 1937; delivery date, February, 1938.

Hull No. 27, Seal, SS183, standard displacement, 1450 tons; keel laid May 25, 1936 launched August 25, 1937; delivery date, March, 1938.

Hull No. 28, Skipjack, SS184, standard displacement, 1450 tons; keel laid July 22, 1936; launching date October 23, 1937; delivery date June, 1938.

Hull No. 29, Sargo (SS188); keel laid May 12, 1937; delivery date June, 1939.

Hull No. 30, Saury (SS189); keel laid June 28, 1937; delivery date July, 1939.

Hull No. 31, Spearfish (SS190); keel laying date September 9, 1937; delivery date September, 1939.

Hull No. 33, Seadragon (SS194); 1450 tons; delivery date December, 1939.

Hull No. 34, Sealion (SS195); 1450 tons; delivery date February 1940.

THE FEDERAL SHIPBUILDING AND DRYDOCK COMPANY

Kearny, N. J.

NEW CONSTRUCTION:

Two destroyers, **DD381 Somers** and **DD383 Warrington;** 1850 tons; keels laid June 27, 1935 and October 10, 1935, respectively; launching dates, March 13, 1937, and May 15, 1937, respectively. **DD381 delivered November 30, 1937.**

Three destroyers, **DD397 Benham, DD398 Ellet and DD399 Lang,** estimated completion, April, June and August 1938; keels laid DD397, September 1, 1936; DD398, December 3, 1936; DD-399, April 5, 1937.

Three 12,800-ton tankers for the Standard Oil Company of New Jersey; 450' x 66'6" x 34'6"; Isherwood Arcform design of hull form and longitudinal hull framing. Hull 144, keel laid February 8, 1937; launched October 9, 1937; **delivered November 24, 1937;** Hull 145, Esso Houston, keel laid June 7, 1937; **launched December 18, 1937;**

Hull 146, keel laid August 16, 1937.

Two destroyers, DD411 and DD412.

Two 12,900 ton tankers for Pan American Petroleum & Transport Co.

Hulls Nos. 149-150, two 12,900 ton tankers for Pan American Petroleum & Transport Co.; Isherwood Arcform design of hull form and longitudinal hull framing. Estimated completion date October, 1938. No. 149, keel laid November 15, 1937.

THE INGALLS IRON WORKS COMPANY

Birmingham, Ala.

NEW CONSTRUCTION:

One 35-ton whirler derrick barge for U. S. Engineers Office, Huntington, W. Va.; 110′ x 52′ x 8′. Launching date September 21; **delivery date, approximately January 1, 1938.**

One steel vegetable oil barge for New York Tank Barge Co., N. Y.; 650 gross tons; capacity 1250 tons; 195′ x 42′ x 12′. Estimated launching date November 1, 1937; **estimated delivery date December 10, 1937.**

JAKOBSON & PETERSON, INC.

Brooklyn, N.Y.

NEW CONSTRUCTION:

One all welded steel diesel bulk oil delivery launch for Socony-Vacuum Oil Co.; 55′ x 13′ 6″ x 7′ deep; 60 HP Model 36A Fairbanks-Morse engine, 3:1 reduction gear.

LEVINGSTON SHIPBUILDING CO.

Orange, Texas

NEW CONSTRUCTION:

Two all welded towboats for Pan American Petroleum & Transport Co., Texas City, Texas; 64′11″, beam molded 18′, depth molded 7′6″; equipped with 380 H.P. Atlas Imperial diesel engine. **Delivery dates December, 1937, and January, 1938.**

Three all welded oil barges; 173′x39′ x8′6″; for Pan American Petroleum & Transport Co., Texas City, Texas. **Delivery by January, 1938.**

One all welded barge 100′ x 36′ x 8′, for Standard Oil Co. of Texas, Houston, Texas. **Delivered December 1, 1937.**

One all welded barge 90′ x 36′ x 8′, for Standard Oil Company of Texas, Houston, Texas. **Delivered December 1, 1937.**

One all welded boiler barge 80′ x 25′ x 6′, for Shell Petroleum Corp. **Delivered December, 1937.**

MARYLAND DRYDOCK CO.

Baltimore, Maryland

NEW CONSTRUCTION: **One double ended steel diesel ferry boat,** 208′ x 62′ x 9′, for the Claiborne-Annapolis Ferry Company; keel laid September 15, 1937; **launched December 11, 1937;** delivery date May, 1938.

THE NEW YORK SHIPBUILDING CORPORATION

Camden, N. J.

NEW CONSTRUCTION:

Three light cruisers; Hull No. 412, Savannah (CL42), Hull No. 413, Nashville (CL43), and Hull No. 416 Phoenix (CL46) of 10,000 tons each for the U.S. Navy Department; keels laid, 1935. **No. 412,** launched May 8, 1937; **No. 413** launched October 2, 1937.

NEWPORT NEWS SHIPBUILDING & DRYDOCK CO.

90 Broad Street, New York

NEW CONSTRUCTION:

H360 aircraft carrier, CV6, Enterprise, for U.S. Navy.; keel laid July 16, 1934; launched October 3, 1936.

H361, light cruiser, CL47, Boise, keel laid April 1, 1935; launched, December 3, 1936.

H362, light cruiser CL49, St. Louis; keel laid December 10, 1936.

Hulls Nos. 363-364, two destroyers, Nos. 413, Mustin, and 414 Russell; keels laid December, 1937.

Hull No. 367, diesel electric tank vessel for Standard Oil Co. of New Jersey; length 260′6″; beam 43′6″; depth 18′3″. Keel laid September, 1937; **launched December 8, 1937.**

Hull No. 369, twin screw mail, passenger and cargo liner for United States Lines Co.

PORTSMOUTH N. H., NAVY YARD

Portsmouth, N. H.

NEW CONSTRUCTION:

SS185 Snapper, submarine; keel laid July 23, 1936; L.B.P. 300′, beam 26′, loaded draft 15′ 7″; launched August 24, 1937; commissioned December 15, 1937; date of completion March 1, 1938.

SS186 Stingray, submarine; keel laid October 1, 1936; L.B.P. 300′, beam 26′, loaded draft 15′7″; launched October 6, 1937; date of completion June 1, 1938.

SS191, Sculpin, submarine; contract period started December 1, 1936; L.B. P. 302′6″, beam 26′10″, loaded draft 16′8″; keel laid September 17, 1937; completion date June 1, 1939.

THE PUSEY & JONES CORP.

Wilmington, Del.

NEW CONSTRUCTION:

Lt. Colonel Ellery W. Niles, twin screw diesel electric drive mine planter for submarine and cable service; L. O. A. 184′, L.B.P. 163′, beam molded 35′, depth molded amidships at sides 17′3″, draft load 10′6″, speed per hour 13 statute miles. Keel laying date, December 15, 1936; launched June 22, 1937; **delivered December, 1937.**

Two single screw, steel freight steamers for the Philadelphia and Norfolk Steamship Co., Philadelphia, Pa. L. O. A. 292′, L.B.P. 280′, beam 48′6″, depth 32′ 3″, draft 18′; geared turbine drive 4000 S. H. P.; 2 water tube boilers. Delivery dates 12½ and 13½ months, respectively. Keel laid for first ship May 20, 1937.

SUN SHIPBUILDING AND DRY DOCK COMPANY

Chester, Pa.

NEW CONSTRUCTION:

Hull No. 160, one oil tanker (steam) 520′x70′x40′ for Atlantic Refining Co.; 18,500 tons; keel laid March 22, 1937; launched November 20, 1937; **delivery date, January, 1938.**

Hull No. 162, steam tanker for Standard Oil Co. of New Jersey; 422′ x 65′ x 35′; 12,900 dwt.; launched October 30, 1937; **delivered December 1, 1937.**

Hull No. 165, diesel tanker for the Texas Company; 465′ x 65′ x 34′ 6″; 12,000 dwt. Launched October 19, 1937; **delivered December 24, 1937.**

Hulls Nos. 166 and 167, two steam tankers for Standard Oil Co. of California; 462′4″ x 65′ x 35′; 12,800 tons deadweight. **No. 166, launching date December 4, 1937; delivered December 26, 1937. No. 167, launching date January 15, 1938;** delivery date February 20, 1938.

Hull No. 168, One diesel tanker for Sun Oil Company, equipped with Sun-Doxford engine; 542′5″ x 70′ x 40′; 18,360 D.W.T. Keel laid September 1, 1937; delivery date June 1, 1938.

Hull No. 169, one oil tanker (steam), 520′ x 70′ x 40′; for Atlantic Refining Co.; 18,500 tons; keel laying date October 11, 1937; delivery date, September, 1938.

Hull No. 170, one single screw steam tanker for Bernuth, Lembcke Co., Inc., New York; length 462′4″; beam molded 65′ 0″; depth molded 35′ 0″, DWT approximately 12,900 tons. Keel laid September 20, 1937; delivery date June, 1938.

Hull No. 171, one single screw steam tanker for Tide Water Associated Oil Co.; 462′ 4″ x 65′ x 35′; 12,900 dwt.; delivery date July 6, 1938.

UNITED SHIPYARDS, Inc.

Staten Island, N.Y.

NEW CONSTRUCTION:

Hulls Nos. 840, 841, and 842; three ferry boats for City of New York; 267′ overall, 66′ extreme breadth, 19′9″ depth; keels laid April 4, April 27, and May 1, 1936, respectively. 840 and 841 launched May 7 and June 3, 1937; **842 launching date December 20, 1937; delivery dates December 18, 1937; January 18, 1938,** and February 21, 1938, respectively.

Hulls Nos. 850, 851, and 852, three sludge vessels for City of New York, Department of Sanitation. Length on W L. 250′. Beam 43′6″, Depth 16′. Keel laying dates, April 14, May 24, and July 22, 1937, respectively; launching dates November 22, 1937, **January 4** and February 1, 1938, respectively; **delivery dates, December 29, 1937;** February 11 and March 11, 1938, respectively.

Hull No. 854, oil barge for Standard-Vacuum Oil Co., Inc. LOA 177′, breadth 36′ depth 13′6″. Keel laid July 22, 1937; launched November 26, 1937; **delivered December 3, 1937.**

Hull No. 856, fireboat for City of New York. Estimated keel laying date March 22, 1938; estimated launching date June 28, 1938; estimated delivery date August 20, 1938.

Dependable Insurance Since 1863

Fire · Automobile · Marine · Casualty · Fidelity · Surety

FIREMAN'S FUND GROUP

Fireman's Fund Insurance Company — Occidental Insurance Company
Home Fire & Marine Insurance Company
Fireman's Fund Indemnity Company — Occidental Indemnity Company

Strength Permanence Stability

New York · Chicago · SAN FRANCISCO · Boston · Atlanta

Insurance Syndicate Expands

American Marine Insurance Market Broadened by Cooperation Between Syndicate and Commission

Cooperating with the United States Maritime Commission in its effort to expand the American marine insurance market, the American Marine Insurance Syndicate will increase from $2,500,000 to $4,000,000 the maximum amount of insurance which the syndicate can write on a single vessel.

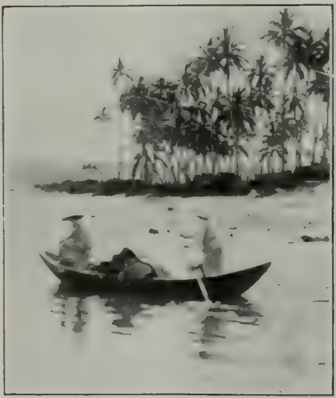
The increase, which will become effective the first of the new year or shortly thereafter, has been made possible by additional American companies joining the syndicate and by present members increasing their participation.

The direct writings of the syndicate will be divided $3,000,000 to strictly owned and controlled American insurance companies, and $1,000,000 to foreign companies which are members and actually doing business in the United States.

To encourage a broad and flexible market, reasonable latitude will be allowed in the way of reinsurance, but the Commission will require that the majority of business be retained at all times by strictly American companies.

Announcement of the syndicate's action in increasing the maximum line it can write on individual vessels was made recently in the following statement which was authorized by the Maritime Commission:

"At the end of last May the Maritime Commission made a preliminary announcement of the steps which it was taking to bring about an increase in the maximum lines which could be placed on American vessels in the American marine insurance market. At that time, at the request of the Commission, the Chairman of the American Marine Insurance Syndicate appointed a committee of prominent underwriters to work on this problem and report to the Commission. Numerous conferences were held and the results have led to a substantial increase in the capacity of the Syndicate. Effective at or shortly after the first of the year the maximum line which can be written by the American Marine Insurance Syndicate on a single vessel is being increased from $2,500,000 to $4,000,000. The direct writings of the Syndicate will be divided $3,000,000 to strictly owned and controlled American insurance companies and $1,000,000 to foreign companies admitted to and doing business in the United States.



This type of coastwise craft has no insurance or reinsurance problems.

"This increase has been brought about by American companies, heretofore not members of the Syndicate, joining and by present members increasing their participations. Reinsurance within the Syndicate is permitted by the Commission providing that the foreign admitted interest in the Syndicate shall not exceed one-third of the capacity of the Syndicate.

"The Commission under the law has the power to approve all insurance placed on vessels in which the

Marine Insurance in All Phases — "All Risks" . . . Inland Marine . . . Ocean Marine

STANDARD MARINE INSURANCE COMPANY, LIMITED
NATIONAL UNION FIRE INSURANCE COMPANY
MERCANTILE INSURANCE COMPANY OF AMERICA

GEO. E. BILLINGS CO.

Pacific Coast General Agents—Richard J. Lutich, Marine Manager

GArfield 3646
308 California St.
SAN FRANCISCO

TRinity 1521
Spreckels Bldg.
LOS ANGELES

SEneca 1478
Colman Bldg.
SEATTLE

MARINE DEPARTMENT
AETNA INSURANCE CO.
QUEEN INSURANCE CO.
MARITIME INSURANCE CO., LTD.
FIDELITY PHENIX FIRE INS. CO.
Commercial Hull Dept.
AUTOMOBILE INS. CO.

Mathews & Livingston
Marine Underwriters

200 BUSH ST. SAN FRANCISCO
Offices at: Colman Bldg. - Seattle 111 West 7th St. - Los Angeles

Commission has a mortgage interest or to which a subsidy is paid.

"In order to maintain and safeguard the national character of the American market, record will be kept of all reinsurance placed by members of the Syndicate, such reports to be available at all times to the Commission. With a view to encouraging a broad and flexible market, reasonable latitude will be allowed in the way of reinsurance but the Commission will require that the majority of the business be retained at all times by strictly American companies.

"Any American company desiring to join the Syndicate may do so providing they are able to comply with the strict financial requirements demanded by the Syndicate. Such additional companies should serve to increase the capacity of the American market. It is hoped that the additional premium income that will be created by the building program initiated by the Commission will encourage additional companies to join the Syndicate.

"With respect to companies not members of the Syndicate, either American or foreign admitted, the Commission will have knowledge of all reinsurance. The purpose of this is to enable the Commission to know at all times where insurance on American hulls is placed.

"With respect to the use of the Insurance Fund now operated by the Commission, the Commission feels that the maintenance of this Fund at its present capacity is not detrimental to the growth of the American commercial market. The Commission feels that the efforts of the Syndicate to increase its capacity should be encouraged, and that the Insurance Fund should be used to preserve a fair and open American market and to supplement this market where necessary.

"The Commission desires a natural orderly growth of the American market and believes that the American Marine Insurance market is now in a position effectively to serve the American Merchant Marine."

A Monthly Review of Tanker Markets

Williams, Dimond & Co., Oscar J. Beyfuss, Mgr., Chartering Department

San Francisco, December 15th

In general there is an upward trend in rates from the lows mentioned in last month's review.

● Time Charters

Little was done in this department, but enough to show that rates remain at 8/6 for diesels for three years.

● Voyage Charters

AMERICAN — Gulf to North of Hatteras: Clean fixtures were done on a basis of 30c while dirty rates are advancing, the latest being 27c basis 30 gravity.

Intercoastal: Nothing new.

FOREIGN—Gulf to U.K./Continent: Steady advances in clean rates brought the market to 29/- and 31/-, while dirty fixtures were fairly steady between 19/- and 20/6.

California to U.K./Continent: Two clean boats were taken, one at 30/- to the Mediterranean, the other was fixed on private terms.

Black Sea to U.K./Continent: Clean rates advanced to 24/- and 25/- while a relet for early position brought 30/-. Dirty fixtures were done at 19/- and 18/6.

Black Sea-Far East: No transactions reported.

California-Australia and New Zealand: Nothing recorded.

California-Far East: Activity continues; typical charters were a clean boat 29/- Japan, 32/- North China, 33/- Hong Kong, Philippines; dirty 24/6 six trips Japan, 25/- two trips Japan and 27/- Shanghai, Hong Kong with 29/- both ports.

Running Lights of Pacific Shipping

● SHIP OPERATOR

WILLIAM P. ROTH, president of Matson Navigation Company. Joined the firm during the regime of the late Edward D. Tenney. Became president in May 1927 when Mr. Tenney was made Chairman of the Board. A Stanford grad . . . a Peninsula resident . . . a horse fancier. There's a William Junior and twin daughters: Berenice and Lurline.

TRAFFIC ●

DEARBORN CLARK, Traffic Manager of American-Hawaiian Steamship Company. Scion of seafaring stock, he started with A-H in boyhood . . . has progressed through all departments of traffic . . . on Atlantic and Pacific seaboards. His hobby: unravelling the complexities of contract bridge.

● OIL TRANSPORTER

GEORGE D. ZEH, manager of the marine department of Tide Water-Associated Oil Company's Associated Division with headquarters in San Francisco. Has a fleet of seventeen petroleum carriers in operation. Joined Associated in 1902 as stenographer. Next he was shipping clerk, then with field pipe lines. He was transferred to San Francisco in 1908 and since that time has been in "Transportation." Hobby—FLY fishing. Hails from Richmondville, New York. He resides in Alameda.

SHIP EXECUTIVE ●

KENNETH D. DAWSON, vice-president of I.M.M. and head of the various subsidiaries on the Pacific Coast. Headquarters San Francisco. His services requested by the U. S. Shipping Board back in World War time . . . then president of Columbia Pacific Shipping for eight years . . . later organizer of States Steamship Company. Still rates Portland one of America's Edens . . . but San Francisco! !

● FOREIGN TRADE BUILDER

HARRY S. SCOTT, president since 1921 of General Steamship Corporation . . . started his shipping career 45 years ago . . . sailing vessels for Barneson Hibbard Co. Few men in the last quarter century have played a more important part in upbuilding Pacific Coast foreign trade. With foresight and courage, plus his natural ability to organize men, has been instrumental in establishing one new steamship line after another. Formed Transoceanic Company in 1917 . . . later active in creation of General Steamship Corporation. . . . Had title of Cavaliere by order of Crown of Italy conferred on him in 1932.

PRESIDENTIAL NOMINEE ●

C. M. LeCOUNT, marine department, General Electric Company, San Francisco . . . just nominated for presidency of Propeller Club of California. A Schenectady-trained man, he came to the Coast 23 years ago. Loves his fishing. Today finds him up in Scotia stalking steelhead. A golfing enthusiast, his ability as a handicapper usually keeps him off the fairway. Lives in the Berkeley hills. Two sons and thousands of friends call him "Dad."

Propeller Club of California Plans Annual Election

Members of the Propeller Club of California have been recently notified of the annual business meeting of the organization to be held Tuesday noon, January 11, 1938.

Secretary-treasurer Stanley E. Allen has dispatched the following official announcement:

To the Members of the Propeller Club of California:

Gentlemen: Your committee, appointed in accordance with Section 1, Article VIII of our by-laws to nominate officers for the year 1938 recommend and nominate the following:

For president:
C. M. LeCount.

For vice-president:
C. E. Finney.

For governors (4 to be elected for 3 year terms):
Henry Blackstone
Cyril Meek
Herman Nichols
L. L. Westling.

Respectfully submitted, Nominating Committee.

Walter J. Walsh, Chairman; H. H. Brann, A. T. Hunter, R. C. Ingram, B. O. Pickard.

Annual election and business meeting will be held Tuesday noon, January 11, 1938, in the Propeller Club Dining Room at the Fairmont Hotel. In accordance with Section III of Article VIII of our by-laws other nominations may be made by petitions signed by ten regular members. In order for a member to vote it is essential that he be in good standing.

Luncheon will be served at 12 noon. The importance of this meeting requires your attendance. Please put this date on your new calendar now.

A brief entertainment program will complete our meeting on this occasion.

By order of the Board of Governors,

Bryant J. O'Connor, Chairman, Luncheon Committee. Stanley E. Allen, Secretary-Treasurer.

Shipping Dean to Address Club

Roger D. Lapham, chairman of the board of American - Hawaiian Steamship Company, will be the speaker at the January 25 meeting of the Propeller Club of California. George A. Armes has been named chairman of the day.

New Standard Oil President

William H. Berg, namesake of the Standard Oil, California, tanker now under construction at the Sun yard in Chester, made the transcontinental trip early this month accompanied by his wife who christened the vessel on December 14th. Illustrations of the launching appear in this issue of Pacific Marine Review and the publishers are glad to have the pleasure of introducing through the medium of these launching photos the newly elected president of the Standard Oil Company of California.

Mr. Berg was chosen to succeed the late Kenneth R. Kingsbury. Announcement was made while the new president was en route to the East Coast.

His elevation to this post climaxes a career of thirty-four years with the company during which he progressed in various departments finally concentrating his ability in production work. He was elected to the board of directors in 1934 . . . named vice-president early in 1937.

Mr. Berg has been a director of the American Petroleum Institute since 1935.

T. M. Robie.

Announce New Manager of F-M Diesel Sales

The appointment of T. M. Robie as manager of the diesel sales division of Fairbanks, Morse & Co., effective November 1, has been announced by A. C. Dodge, vice-president in charge of sales.

Robie has been associated with Fairbanks-Morse since he returned from World War overseas service in 1919, serving in numerous capacities in the manufacturing and sales division. Since 1932 he had been in charge of diesel sales to resale manufacturers. Previously he was associated with the New York branch office for one year and the Dallas office for two years, and was employed at the factory on diesel engine designing, testing and building for nine years.

Upon his graduation from the University of Michigan in 1914, where he specialized in the study of internal combustion engines, Robie was employed by General Electric Co. on locomotive test and on development of high-speed opposed-piston diesel generating sets for stationary and diesel-electric railway locomotive application. He operated diesel power plants in New Mexico for two years previous to entering war service.

With his experience in the fields of manufacturing, operating and sales, Robie is well fitted to carry out the duties of his new position as manager of the diesel sales division.

DOLLAR STEAMSHIP LINES

EXPRESS FREIGHT-PASSENGER AND REFRIGERATOR SERVICES

ROUND-THE-WORLD

ATLANTIC-FAR EAST TRANS-PACIFIC

INTERCOASTAL MEDITERRANEAN - U. S. A.

Dollar Steamship Lines Inc., Ltd.

ROBERT DOLLAR BLDG., SAN FRANCISCO - DOuglas 6000

OFFICES & AGENCIES THROUGHOUT THE WORLD

BOSTON
CHICAGO
CLEVELAND
DETROIT
LOS ANGELES

SEATTLE
NEW YORK
PORTLAND, ORE.
WASHINGTON, D.C.

FEDERAL PAINT

is consistently specified by operators of tonnage in all classifications of Pacific Ocean Shipping. We manufacture marine paints and protective compositions exclusively.

These Products of FEDERAL are: Anti-Fouling; Anti-Corrosive; Boottopping; Cabin Paints; Copper Paints; Deck Paints; Deck House Paints; Hold Paints; Red Lead (Mixed); Smoke Stack Paints; Topside Paints.

Color Card On Request

The Federal Composition & Paint Co., Inc.

33 Rector Street, New York, N.Y.

ON THE PACIFIC COAST:

SEATTLE, WASHINGTON
A. T. B. Shiels
108 West Lee Street

PORTLAND, OREGON
Chalmers Shipping Co.
Board of Trade Building

SAN FRANCISCO, CALIF.
Pillsbury & Curtis
310 Sansome St. KEarny 3302-3

SAN PEDRO, CALIF.
Robert S. Gardner
P. O. Box "C"

Agents and Stocks in all the Principal Ports

Appointed to New Matson Line Post

Captain Andrew Townsend, Jr., received the congratulations of his friends this month upon the news of his appointment as Assistant to the President of Matson Navigation Co.

Capt. Townsend's progress with the Matson line has been inspiring. He joined the fleet in 1919 as third mate. In due time he made the successive steps to the rank of Captain and as master he has commanded these Matson ships: Makena, Makili, Manulani, the second Lurline, Matsonia, Maui, Ventura, Monterey, Malolo.

Capt. Andrew Townsend, Jr.

Captain Townsend is the son of the picturesque old veteran of deepwater sailing ships . . . Andrew Townsend, Sr. The "old-timer" who endowed his namesake with the true love of the sea is now retired and resides in Alameda.

The position of Assistant to the President is a new one in the Matson Executive organization.

XZIT Chief Visits Northwest

Howell Ware, Pacific Coast Chief of XZIT, was a Portland and Seattle visitor during December.

Accompanied by M. A. Le Doux of the San Francisco sales office, Mr. Ware spent several days with the distributors of the XZIT products in the Northwest where Jack Keel was appointed to assist Guy M. Thompson in the Sound district.

Mackay Engineer Receives Institute Honors

The Institute of Radio Engineers, international organization of the men active in operations, research and development in radio communication, has elected as its next President, HARADEN PRATT, Vice President and Chief Engineer of Mackay Radio and Telegraph Company.

Mr. Pratt was graduated as mechanical and electrical engineer from the University of California in 1914 and began his work in radio immediately when he assisted in the construction of stations at Bolinas and Marshall, California, which were the most powerful of that day.

He joined the Navy Department as Expert Radio Aide in 1915, was in charge of radio laboratory and engineering at Mare Island Navy Yard, San Francisco, then at Washington, D.C. in charge of construction and maintenance of all high power naval radio stations, including private stations operated by the Navy Department during the War period.

He joined the Federal Telegraph Company (now part of Mackay Radio) in 1920 and was placed in charge of the Company's factory at Palo Alto and in charge also of the building of its inter-city radiotelegraph system. He turned to aircraft aviation, establishing a short-wave radio system for Western Air Express, and then joined the Department of Commerce in charge of the development of radio aids for Air Navigation, Bureau of Standards.

HAMMOND PACIFIC COAST REPRESENTATIVES

Following the inauguration of its service to Puget Sound, the Hammond Shipping Company, Ltd., announces it will be represented in the various Pacific Coast ports as follows:

At San Francisco: L. C. Hammond, president; G. B. McLeod, vice president; R. C. Robinson, vice president in charge of traffic and operations; F. T. Adams, freight traffic manager; S. L. Rea, secretary-treasurer.

At Los Angeles: F. C. Pique, general freight agent; Ralph Hylton, district freight agent.

At Portland: W. L. Williams, northwest manager; Loren D. Davis, assistant freight traffic manager; H. C. Ashton, local agent.

At Seattle: R. J. McElhaney, general freight agent; Percy C. Stay, district freight agent.

At Eureka: W. R. Hunter, general freight agent.

CAPTAIN FRANK JOHNSON

The Matson Navigation Company has appointed Captain Frank Johnson as port captain at San Francisco, according to recent announcement. Captain Johnson was formerly master of the Yale, and when that ship was withdrawn from service he became relief captain with Matson, for the last year or so being in command of the Malolo.

Captain Johnson succeeds Captain Andrew Townsend, Jr., the latter having been appointed assistant to William P. Roth, president. He has served as captain of the company's freighters and passenger liners for many years at various times.

PORTLAND COMMISSION OF PUBLIC DOCKS

John H. Burgard, chairman of the Portland Commission of Public Docks, was recently reappointed to the board for a six year term, after serving continuously since 1912. He has been a member throughout the period that saw all of the port's terminals and grain elevators constructed. The addition of L. R. Teeple to the Commission, succeeding T. J. Mahoney, deceased, was effected at the same time.

Galley Floor Safety
on the "Queen Mary"...

Alundum Aggregate in Terrazzo

THE latest in design—the latest in materials—that's the keynote of the "Queen Mary." So the builders selected a modern material for the galley floors—Alundum Aggregate in terrazzo. This combination gives a surface that is permanently non-slip—wet or dry.

This non-slip terrazzo flooring was used for other places, too, aboard this great Cunard-White Star vessel—places used by passengers and crew.

Write for Catalog C which gives full information about Alundum Aggregate for terrazzo.

If you prefer tile there are Alundum Floor Tile and Alundum Ceramic Mosaic Tile—two other Norton Floors products that are effectively non-slip even when wet—described in Catalogs A and B respectively.

NORTON COMPANY, WORCESTER, MASS.

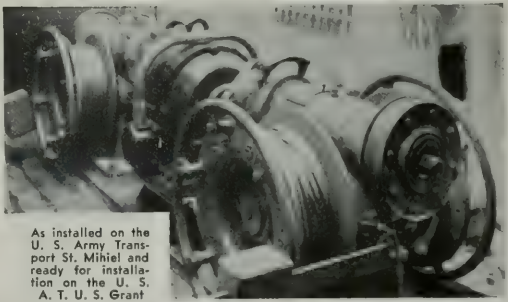
New York Chicago Detroit Philadelphia Pittsburgh
Hartford Cleveland Hamilton, Ont. London Paris
Wesseling, Germany Corsico, Italy

T-45 A

NORTON FLOORS
ALUNDUM TILES—TREADS—AGGREGATES

THE Genco
POWER
AND HAND
WINCH

... for launching life boats aboard your ships *will more than meet requirements*



As installed on the U. S. Army Transport St. Mihiel and ready for installation on the U. S. A. T. U. S. Grant

GENCO WINCHES have been subjected to vigorous tests from which they have triumphed over all lifting and lowering requirements . . . WITH A SUBSTANTIAL EXTRA FACTOR OF SAFETY.

GENERAL ENGINEERING & DRY DOCK CO.

1100 Sansome Street
San Francisco

Foot of 5th Avenue
Oakland

Foot of Schiller St.
Alameda

Names and News

CLAY HUTCHISON

A great influx of Eastern tourists to the Pacific Coast in 1938 is the prediction of Clay Hutchison, general passenger agent of the Grace Line, returning with Mrs. Hutchison from a tour of the line's offices in Mexico, Central America and Cuba.

FRANK. E. BURNS

After a sudden illness, Frank Edgar Burns, Seattle banker and former prominent Puget Sound shipping man, passed away at the age of 67. He had been very active in the Alaska Steamship Company, with which company he was a leading executive, and was vice president of the Puget Sound Navigation Co., president of the Port Townsend Southern Railway Co., and vice president and director of the Seattle Trust and Savings Bank.

CAPTAIN HARRY H. BIRKHOLM

Succeeding Edgar M. Wilson, general agent of the Dollar Line, who held the office with the association for three years, Captain Harry H. Birkholm, vice president and Southern California manager of General Steamship Corporation, was elected president of the Los Angeles Steamship Association for a one year term beginning on January 1. R. V. Ross, district manager for Furness (Pacific) Ltd., was re-elected vice president, and F. H. Hooper, district manager for American-Hawaiian Steamship Company, secretary-treasurer.

C. D. GIBBONS

Resigning his position with the Maritime Commission's division of finance, C. D. Gibbons will become assistant treasurer of the United States Lines on January 15, it was announced. He will be assistant to Raymond M. Hicks, treasurer, with whom he was associated when both were connected with the Merchant Fleet Corporation.

Gibbons succeeded Hicks on the Shipping Board as assistant treasurer when the latter became an officer of the U. S. Lines. He served in this capacity until joining the Maritime Commission when that organization was formed.

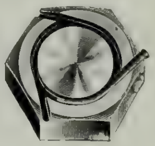
CAPTAIN JOHANNES J. BIJL

Advices reaching E. F. R. de Lanoy, Pacific Coast general manager of Holland-America Line, state that Captain Johannes J. Bijl, master of the Statendam, has been appointed commander of the new flagship Nieuw Amsterdam, launched last April. The ship is scheduled to make her maiden voyage from Rotterdam on May 11.

Promotion of Captain Bijl brought about a number of changes in personnel: Captain George J. Barendse replaces him on the Statendam, Captain Peter Lagaay takes over the Rotterdam, Captain Abraham Filippo transfers to the Volendam, and Captain J. P. Wepster commands the Veendam.

CAPTAIN JOHN HALVORSEN

We note with regret the passing of Captain John Halvorsen of the shore personnel of McCormick Steamship Company, where he had served during the past three years. Before this time Captain Halvorsen was operating manager on the Atlantic Coast for the company.



Merchant Marine Club Holds Christmas Party

Programmed as the last social event of 1937, a gay Christmas Dance and Frolic was staged by the Merchant Marine Officers Club at their quarters, 23 California Street, in San Francisco on Tuesday evening, December 21.

Members were privileged to bring their friends to the happy-go-lucky carnival of mirth and merriment where host William Don presented several entertainment features which were royally acclaimed.

Officers of the Club formed the reception committee and a goodly attendance observed the rounding-out of the social organization's first year.

S.S.LURLINE • S.S.MARIPOSA • S.S.MONTEREY • S.S.MATSONIA

Out in the tranquil Pacific . . in America's famous island pleasure-spot, smart gaiety is at its height among a cosmopolitan throng finding new ways to play, new secrets of happiness. Summer seas . . . sailed by luxurious Matson liners every few days from California . . . call you to Hawaii!

Royal Hawaiian and Moana hotel reservations at Waikiki are made when booking steamer passage. A distinct convenience to Matson Travelers.

Fares: California to Honolulu (each way)
FIRST CLASS from $125
CABIN CLASS from . . . $85

MATSON SOUTH PACIFIC CRUISES. *Personally-escorted* to New Zealand and Australia every four weeks. Over 17,000 miles via Hawaii, Samoa and Fiji; 48 days; 12 delightful shore excursions. All-inclusive-cost, complete cruise, First Class, from $775.

SHIPPERS: *Steamers Lurline, Mariposa, Monterey, Matsonia* provide swift freight service to Hawaii, with modern refrigeration facilities. The *Mariposa* and *Monterey* continue southward to New Zealand and Australia via Samoa and Fiji. Also regular and frequent freighter service from Pacific Coast ports.

Details from Travel Agent or:

MATSON LINE-OCEANIC LINE
San Francisco · Los Angeles · Seattle
San Diego · Portland

In Philadelphia it's the

HOTEL PHILADELPHIAN

Highly recommended by experienced travelers the world over for its warm hospitality; its excellent cuisine served in comfortably Air-Conditioned Restaurants; its convenient location to the business section; and its unlimited parking facilities.

600 ROOMS with bath from $2.75 up

DANIEL CRAWFORD, JR.
MANAGER

39TH AND CHESTNUT STREETS
PHILADELPHIA, PA.

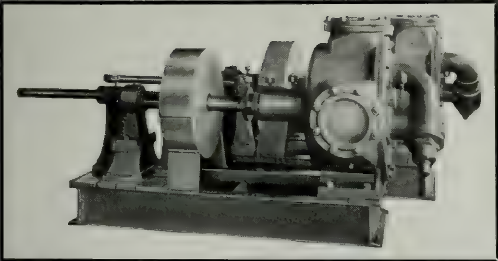
The Distributors of

WALLROPE

extend cordial greetings to the ship and boat owners in our districts in appreciation of their valued goodwill and patronage during 1937.

At Your Service in 1938

Gilmore Steel & Supply Co., San Francisco, Calif.
Boat Owners Service, Monterey, Calif.
Howard Supply Co., Los Angeles, Calif.
National Iron Equipment & Supply Co., San Diego, Calif.
J. E. Haseltine Co., Portland, Ore.
Nordby Supply Co., Seattle, Wash.
Campbell Hdwe. & Supply Co., Seattle, Wash.



LOOKING FOR A ROTARY PUMP?

If YOU are looking for a rotary pump, check these FACTS. First of all VIKING is built by the LARGEST exclusive rotary pump factory in the WORLD. It handles all clean liquids, regardless of viscosity—with suction lifts up to 20 feet. Discharges pressures up to 50 pounds per square inch.* It has been copied in design by more manufacturers than any other style . . . and it is STILL first in the field. Stop looking . . . start writing—get bulletins from Viking.
*Conservative limit—suitable for higher pressures on many applications.

2038 S. Santa Fe Avenue Los Angeles, Calif.
Pacific Coast Distributors
DE LAVAL PACIFIC CO.
61 Beale St., San Francisco, Calif.

VIKING PUMP CO.
CEDAR FALLS, IOWA

Does anyone KNOW which is the RIGHT alloy for condenser tubes?

The special alloys usually make the tubing or retubing of a condenser very expensive. Are not most of them new and untried in actual service? Sooner or later tubes of ANY alloy must be renewed but

AIR AND EROSION ELIMINATOR
Patented

regularly obtains three or more times the tube life from standard Admiralty or Muntz Metal tubes.

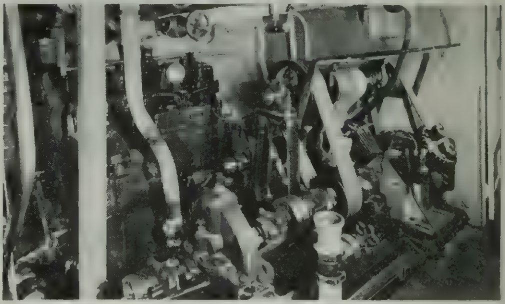
Three ships operated by one of our customers averaged, with admiralty mixture tubes, just three years of condenser tube life, per ship. Equipping these condensers with THE AIR & EROSION ELIMINATOR has resulted in over 10½ years of tube life, per ship, and there is no indication of tube failure yet. Write for booklet.

CONDENSER SERVICE & ENGINEERING CO., INC.
Main Offices:
HOBOKEN, N. J., U. S. A.
E. V. Winter Co., 19 Main Street, San Francisco

An Interesting Tug Conversion

Tug George W.

Her Atlas Power Plant



Her Compact Auxiliary Unit

Recently the Shaver Transportation Company of Portland, Oregon, purchased the steamer G. H. Mendell from the U. S. Engineers Corps and converted her into a diesel tug for their general towing service on the Willamette and Columbia Rivers, renaming her George W. for their founder and the grandfather of the present owners, Captains Hosmer T. and Leonard R. Shaver.

This vessel, built at Portland for the Engineers Corps in 1889, has a staunch wooden hull. She was rebuilt by the Engineers in 1912 and again in 1931. The Shaver Transportation Company stiffened the hull considerably by building in sister keelsons 22 inches x 24 inches x 60 feet length to serve as engine timbers. They also cut away the after end of the house to make room for installing a towing engine. The present dimensions are 93.3 feet length, 20 feet beam, and 9 feet 9.35 inches depth, with a gross registered tonnage of 117 and a net of 41 tons.

For propulsion power an Atlas Imperial Directly Reversible Marine Diesel Engine was chosen. The unit installed is a six cylinder 14½ inch bore by 18 inch stroke, and developing 480 brake horsepower at 275 revolutions per minute. It drives directly a 3 bladed 79-inch diameter by 57-inch pitch manganese bronze wheel furnished by the Johnston Propeller Works of Portland. Full pilot house control of the main engine is installed.

On June 26, on trials in the river, this engine drove the George W. at a speed of 15 statute miles an hour over the official measured mile.

The steering gear, towing winch, and reversing gear for the main engine are all operated by compressed air, and in order to assure ample air for these purposes the tug is equipped with 6 air storage tanks each 30 inches in diameter and 8 feet long.

A very interesting auxiliary unit is installed on this tug. This is a steel plate eye beam foundation upon which is mounted practically all the auxiliary machinery in the main engine room. As will be noted in the illustration, this is a very compact installation. It comprises the following items:

A four-cylinder 4¾-inch bore by 6½-inch stroke Atimco Type Atlas Imperial diesel engine; a 10-kilowatt 125-volt electric generator; an Ingersoll-Rand 600 gallons per minute centrifugal pump; an Ingersoll-Rand 2 stage air cooled compressor; and an Allis Chalmers Vee belt drive jack shaft equipped with separately clutched pulleys.

The towing winch was built originally for a steam stern wheeler by the Willamette Iron & Steel Company of Portland. It was reconditioned and its cylinders bushed for operation by compressed air. Its drum carries 1200 feet of 13/16 inch steel wire towing cable.

Thus equipped, the George W. should be good for many years of dependable, economical towing service on the Columbia and the Willamette.

903 FIFE BLDG.
1 DRUMM ST.

THOMAS A. SHORT

Successor to

C. V. LANE

Marine Representative:
Thos. A. Short,
1 Drumm Street, San Francisco

HYDE STEERING GEARS
HYDE WINCHES
HYDE WINDLASSES
HYDE CAPSTANS
HYDE MANGANESE BRONZE PROPELLERS & CASTINGS
A. B. SANDS & SON CO., PLUMBING FIXTURES
SMOLENSKY NOISELESS CHECK VALVES
BACHARACH INDUSTRIAL INSTRUMENT COMPANY
DIEHL MFG. CO. FANS, MOTORS, GENERATORS
SUBMARINE SIGNAL COMPANY FATHOMETER
COLORED CRAYONS
METAL WORKERS' CRAYONS
WELIN QUADRANT AND SHEATH SCREW DAVITS
MACLACHLAN GRAVITY DAVITS
LIFEBOAT WINCHES
METALLIC LIFEBOATS AND LIFERAFTS
SHORT OIL SEPARATOR
WILLIAM W. NUGENT & CO., OIL FILTERS
U. S. METALLIC PACKING
CONSOL RUST REMOVER
CONSOL RED and BLACK
HASKELITE—PHEMALOID
PLYMETL ORNAMENTAL PANELS

B. F. GOODRICH CUTLESS RUBBER BEARINGS

MEEHANITE CASTINGS—PISTON RING STOCK, BURNER CONES, ETC. R. P. ADAMS POROUS FILTERS

SHORT OIL DETECTING SERVICE FOR PROTECTING BOILER FEED WATER AND FUEL OIL HEATERS

Hyde Windlass Company

Steering Gears, Windlasses, Capstans, Bronze Propellers —as installed on America's finest ships.

Bath, Maine

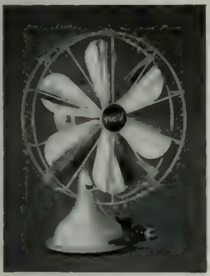
Pacific Coast Representative:
Thos. A. Short, 1 Drumm Street, San Francisco

Inter-Coastal Paint Corporation

SAN LEANDRO, CALIFORNIA

Originators and sole manufacturers of CONSOL both plain and in colors. A conditioning solution for metal surfaces that have become corroded. Not only a scale remover but a preservative as well. Gives excellent results when applied to boottop belt, hull, holds, bilges, tank tops, chain lockers, ventilator trunks, decks and so forth. Is non-inflammable and contains no acids or chemicals that are injurious to men or metal.

Marine Representative
Thos. A. Short, 1 Drumm Street, San Francisco

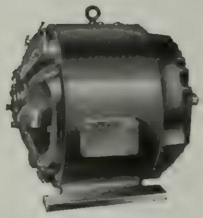


Marine Motors, Generators and Ventilating Equipment

DIEHL MANUFACTURING COMPANY

Electrical Division of
THE SINGER MANUFACTURING CO.
Elizabethport, New Jersey

San Francisco Representatives:
MARINE ELECTRIC CO. Desk and Wall Fans
THOMAS A. SHORT Motors, Generators, etc.



PLYMETL *fireproof* **PANELS**

Plymetl bulkheads, as installed on the "R. P. Resor" and "T. C. McCobb," meet the latest requirements of the N.F.P.A. for fire resistance. The qualities listed below are available ONLY in Plymetl:

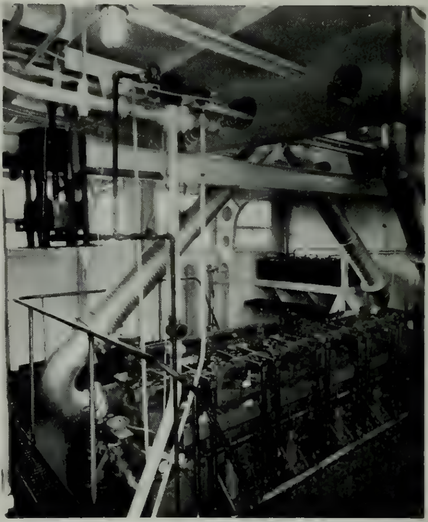
- Fire Resistance
- Lightness
- Ability to take fine finishes
- Sound Deadening
- Heat Insulating
- Strength

Pacific Coast Representative:
THOMAS A. SHORT, 1 Drumm Street, San Francisco

HASKELITE MANUFACTURING CORPORATION . . 208 W. Washington St., Chicago, Ill.

Two Shallow Draft Towboats

The Dravo Corporation has recently placed in service the first of two single screw shallow draft towboats. The boat, known as Dravo 41, is equipped with the Dravo system of skegs and rudders as developed for use in single screw shallow draft towboats and first used on their towboat Pioneer. This system uses twin skegs so arranged as to eliminate the "side crawl" characteristic of a single screw tunnel boat.


Engine room of the Dravo 41, showing the cylinder tops and valve mechanism of the 350 B.H.P. Nelseco diesel engine.

The second boat, Dravo 42, will be from the same lines, have the same power plant, but will be equipped with a Kort nozzle propulsion system. This device also eliminates the "side crawl" in a single screw tunnel boat, and gives added thrust without increased horsepower. The Kort nozzle has been successfully installed on more than 400 vessels abroad. The advantages to be gained through its use have been very well defined when related to seagoing or harbor vessels, such as tugs and trawlers. They have also been well defined on shallow draft vessels where the fleet is towed aft on a line. For use on American rivers, where a flotilla is pushed by the towboat, it is necessary that maximum power be available for backing and maximum steering thrust obtained when backing. It is planned to compile comparative performance data on the two vessels, and some interesting facts undoubtedly will be revealed.

Preliminary tests made on Dravo 41 have shown very satisfactory results. This boat has been shown to have a backing power equal to its going ahead power, both figures being measured at dock test or 100 per cent slip. As far as is known it is the only screw boat with this proved ability, and in this respect is superior to stern wheel towboats, wherein the backing thrust is always considerably less than the forward thrust.

These vessels have an overall length of 94 feet, a beam of 21 feet, and a depth of six feet nine inches. The draft, in fully loaded condition, is four feet nine inches aft and five feet forward. Dravo 41 in trials has shown a light speed of 11.6 miles per hour.

The vessels are equipped with six cylinder 12½ x 18 Nelseco diesel engines, factory tested to 350 horsepower at 280 revolutions per minute. In service they will operate at horsepowers ranging from 300 to 350, depending on the load, and will be directly connected to the screws.

The towboats are of all welded steel construction, both as to hull and superstructure. The hull is divided into four principal water-tight compartments and two fuel oil tanks, the total fuel capacity being 5,600 gallons. These vessels are somewhat unusual for river towboats in that they have a fully modeled bow. This bow has demonstrated its worth not only from the viewpoint of overcoming resistance but also from its

Dravo 41 making a sharp turn on her full speed trials.

EUGENE V. WINTER CO.

●

Representing

NATIONAL TRANSIT PUMP & MACHINE CO.
Reciprocating and rotary pumps for marine, industrial and refinery service.

CONDENSER SERVICE & ENGINEERING CO., INC.
Heat Exchanger Specialists.

REILLY FEED WATER COILS
Carried in San Francisco stock.

THE MAXIM SILENCER COMPANY
All types of silencers and spark arresters for gasoline and diesel engines, and air compressors.

RED HAND COMPOSITIONS CO., INC.
Marine Bottom Paints.

KOPPERS CO.—AMERICAN HAMMERED PISTON RING DIVISION
Piston rings for gasoline, diesel and steam engines, air compressors. Diameters from 1 inch to 120 inches—separately cast.

EUGENE V. WINTER CO.
19 Main Street, San Francisco, Calif.
Phone: DOuglas 2714

Mo-Lo

The Perfect Piston Iron
No Blow Holes, No Waste and Machines Easily.
294 Sizes in Stock.
Ask for our stock list.

TRADE LESLIE MARK

PRESSURE REDUCING VALVES
PUMP GOVERNORS
TEMPERATURE REGULATORS
SELF CLEANING STRAINERS

TRADE TYFON MARK
WHISTLES
SIGNALS

LESLIE CO., FOUNDERS AND MANUFACTURERS
LYNDHURST, N. J.

John H. Marvin Co.
1016 First Ave. So.
Seattle

Llewellyn Supply Co.
660 So. Serrano Ave.
Los Angeles

Llewellyn Supply Co.
245 Fries St.
Wilmington, Calif.

SANDUSKY CENTRIFUGALLY CAST
BRONZE - BRASS - MONEL
TAIL SHAFT LINERS
PUMP LINERS - BUSHINGS
SANDUSKY FOUNDRY & MACHINE CO.
SANDUSKY, OHIO

CORDES BROS.
200 DAVIS STREET SAN FRANCISCO

FRANCE

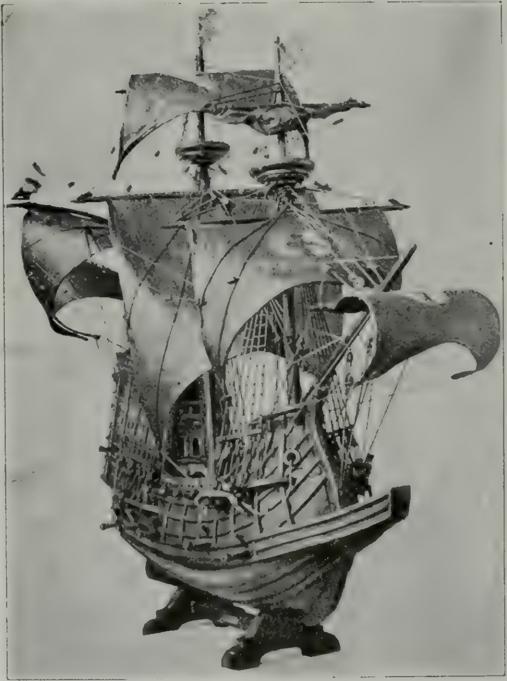
TRADE MARK

"Thirty-Nine Years Satisfactory Performance"

Manufactured exclusively by

FRANCE PACKING COMPANY
Main Office and Factory
TACONY, PHILADELPHIA

Represented by
SAN FRANCISCO—HERCULES EQUIPMENT & RUBBER CO.
550 - 3rd Street—EXbrook 2575
SEATTLE—GUY M. THOMPSON
1241 Railroad Ave., South—Phone MAin 1870
PORTLAND—E. B. HUSTON
127 S. W. First Ave.—Phone ATwater 6754



ability to throw ice and drift to the side rather than under the boat. In addition, the modeled bow gives excellent steering and maneuvering qualities to the boat, either with or without tow.

There are no accommodations below the main deck. The crew is quartered in two-man cabins, there being four such cabins on the main deck. Accommodations are sufficient for a double crew, permitting operation of the vessel 24 hours a day. The main deck also contains a crew's lounge, a combination galley and mess, and two toilet rooms. A 13½ cubic foot Frigidaire refrigerating unit is included. On the upper deck are quarters for the master and pilot. Slightly raised above the upper deck is the pilot house.

The boats are controlled completely from the pilot house by means of a control pedestal using Bendix-Westinghouse control valves. Hydraulic steering is fitted, a single ram controlling the twin steering rudders and twin backing rudders. Power for the steering ram is obtained during long runs through a hydraulic pump operated by chain drive from the main shaft. A second motor driven hydraulic pump is fitted, which has an electric pressure control switch. When insufficient pressure is produced by the shaft driven pump, as in maneuvering, the electric pump picks up the load. These hydraulic pumps are supplied by the Racine Tool and Machine Co.

The vessel is equipped with a 1000 watt incandescent light on the pilot house roof and a pilot house controlled Carlisle and Finch arc searchlight located forward on the upper deck.

Pilot house of Dravo 41, featuring steering and engine controls.

Auxiliary power is generated by a 20 K.W. National Superior 4 cylinder diesel generator set, mounted on Korfund vibro-dampeners, the power being used for the 15 horsepower Ingersoll-Rand air compressor, the 10 horsepower Ingersoll-Rand air compressor, the 10 horsepower Dravo capstan, and the usual lighting circuits. A 56 cell "Philco" storage battery is "floated" on the line. In addition to generating electricity, the auxiliary diesel engine is V belt connected to a Westco turbine type, 100 gallon per minute fire and bilge pump. The switchboards are supplied by the Penn Electrical Company and are fitted with voltage regulators of the Safety Car Heating and Lighting Company type..

These boats have a steam heating plant consisting of an oil fired Pacific boiler furnishing steam to fan driven unit heaters.

The trials on both boats are being carried out through the medium of the Dravo dynamometer barge, and will include not only dock trials but also river trials, using various sizes of fleets in order to obtain the full range of comparison.

Above: A new type all welded steel lighter built by the Dravo Corporation for the Reading Company. All cargo carried in deck house, which is 89′6″ x 29′6″ x 12′ high inside measurement. At right: An all welded steel barge for baled wood pulp. This barge is 255′ x 40′ x 14′ and has a capacity for 2000 net tons of wood pulp. Both barges were built by Dravo at their Wilmington, Delaware, shipyards.

Pacific Paint & Varnish Co.

Synthex Red Lead Primer (Q. D.)
" Anti-Corrosive
" Anti-Fouling
" White Enamel-Non-Bilge (O.S. & I.S.)
" Cabin Enamels (Q. D.)
" Mast Colors, Hull Black
" Boottopping, etc.

Synthex Marine Spar Varnishes and Yacht White Enamel

Aluminum Enamel

Flat White (Inside & Outside)

A specialized finish for each paintable surface.

Pacific Marine Finishes have been used successfully for years by most of the important steamship companies. Each represents a specially developed product for a specific purpose. Quality—not price—is the objective of our Research Department.

L. M. DuCOMMUN
President

San Francisco and Berkeley

A. B. ROBERTSON
Vice President

"WYBROCK" BENDING OAK
SIAM TEAK DECKING and PLANK
Ironbark, Giho, Spotted Gum, Oak and Jenisero Timbers

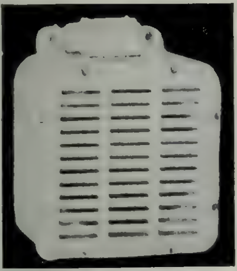
WhiteBrothers
Hardwood Headquarters

Specialists in all Ship and Boat Material
5th & Brannan Streets . . . . San Francisco
500 High Street . . . . Oakland

FERROKOTE

BITUMINOUS COATINGS - MARINE & INDUSTRIAL PAINTS

S. J. PORTER COMPANY
345 VERMONT ST. SAN FRANCISCO



REMLER

Marine Loudspeaker Systems

Remler equipment—built in accordance with regulations of the Bureau of Marine Inspection and Navigation — is backed by the reputation of a twenty year old firm organized in 1918 to build and install ship wireless.

REMLER COMPANY Ltd.
2101 Bryant St. San Francisco

Contributing to your overhead economies!

PLYMOUTH ROPE . . . offers longer life and greater dependability in hard service because of its unsurpassable QUALITY

PLYMOUTH 1824

PLYMOUTH CORDAGE COMPANY
NORTH PLYMOUTH • MASS

BABCOCK & WILCOX BOILERS

Extra Values to Ship Owners and Builders

In DESIGN
Marine Boilers for Marine Service

In TRIAL RUNS
Experience Frequently Saves Money

In CONTINUOUS SERVICE
Regular Visits of B & W Service Men

The BABCOCK & WILCOX COMPANY, New York
Pacific Coast Offices:
450 Mission Street - San Francisco
Seattle Portland Los Angeles

A New Marine Storage Battery

USL Battery Corporation announces a new, heavy duty service marine battery to be known as the USL Durapak. High capacity and extra long life are claimed for this battery in such services as lighting, starting gas or diesel engines, and in such power applications as raising gangways, operating pumps, winches, blowers, compressors, boat hoists, sanitary and communication systems, and air conditioning and refrigeration apparatus. This new battery is said to possess a number of constructional features, all of which have been tried and proved, but never before combined in one battery.

U. S. L. new heavy duty marine battery.

The major feature is a new positive plate with the following advantages: (1) Patented "sectional" construction to withstand expansion and contraction stresses; (2) Heavy, one-piece plate grid for greater mechanical plate strength (longer plate life), and for greater electrical conductivity throughout plate (greater power output); (3) Activite, a special USL plate material, which is more active chemically, to give greater electrical output; (4) Glass filter pads which prevent loss of plate material and provide longer plate life; (5) Unique, porous rubber plate shielding holds the glass filter pads firmly and permanently against the plate surface and allows quicker diffusion of electrolyte between plates. It is claimed that this results in longer battery life and greater power output.

Other constructional features are "Permatex" (all rubber) separators to balance the long service life of the positive plates, and improved negative plates with tapered tops and insulated edges for extra protection against short circuits.

These new USL Durapak batteries are available in many types and sizes to meet all installation space and power requirements normally encountered on shipboard.

China Marine Designs Will be Shown at S.F. Fair

By Chingwah Lee

China's contributions to marine design and progress will be one of the features displayed in China Village at the 1939 Golden Gate International Exposition on San Francisco Bay.

In this village, a replica of an ancient walled city, a multi-storied pagoda will be built to display China's many useful inventions during the centuries. One floor in this building will be devoted to a museum of Chinese marine designs.

The fact that China is essentially an agricultural nation has obscured her as a great maritime nation. Few people realize that China was the first of the ancient nations to undertake deep sea voyages and today has more vessels afloat than all the rest of the world combined.

Among the outstanding innovations by Chinese shipbuilders were the leeboard, the balanced rudder, and the water tight compartmental ship. These and many other important marine inventions will be shown in the Chinese pagoda at the $50,000,000 Pageant of the Pacific.

The leeboard, a frame of planks lowered on the lee side to arrest drift in the vessel when close-hauled by giving her greater draft, a device so popular in England and Holland today, was known in China many centuries ago.

A unique invention is the balanced rudder, consisting of the addition of a small blade in front of the rudder post that absorbs part of the force of the water, thus balancing the strain on the main wing of the rudder. This type of rudder enables a single helmsman to steer the heaviest junks. Some rudder posts are forked to insure greater rigidity.

A typical junk is divided into from six to ten watertight compartments. This idea of watertight bulkheads, not adopted by Western shipbuilders until recent times, has been employed by the Chinese for many generations.

Models of various types of Chinese craft will be shown at this exhibit. These craft, which show a wide range of adaptation to local conditions, include cargo junks, fisher junks, pleasure boats, boat dwellers' barges, river rafts and sampans.

In addition to these scale models it is expected that a full sized junk will be anchored in the Port of the Trade Winds off Treasure Island to be inspected by visitors from all over the world during the Exposition.

Two Destroyers Delivered

Boston Navy Yard delivered two light destroyers, the Mugford and the Ralph Talbot, during December. This yard has six more destroyers and one harbor tug under construction.

Quips that Pass in the Night

His Orders

"Look here, my lad," said the village grocer, "for the seventh time this week I've caught you asleep in the shop. What do you mean by it?"

"Well, sir," replied the puzzled youth, pulling a much-thumbed piece of paper from his trousers pocket, "this advertisement says that you wanted a boy to sleep on the premises."

Better Than Fourth of July

Sister: "Freddy, don't you think you'd better go to bed now?"

Little Brother: "No, I want to stick around and see your friend explode first."

Sister's Boy Friend: "Good gracious. Whatever can the child mean?"

Little Brother: "I heard Minnie tell Mamma you were about ready to pop!"

A lady named Mrs. Carr had ten children. When the tenth one arrived a neighbor said to her:

"Well, I see you have another little Carr."

"Yes," replied the mother, "and as far as I'm concerned it is the caboose."

A London welfare club gives an annual bathing outing to newsboys.

Said one: "I say, Bill, ain't you dirty!"

Bill: "Yes, I missed the train last year!"

Not Today

Wifey: "There's an old clothes man at the door."

Hubby: "Tell him I've got all I need."

The foreman of an electrical repair shop was interviewing a bright oy who was applying for a position.

"Do you know anything at all bout electrical apparatus?"

"Yes, sir," was the prompt reply.

"What is an armature?" asked the foreman.

"Oh, that's a guy who sings for Major Bowes."

Inflated Youth

"Has she kept her girlish figure?"

"Kept it? Man, she has doubled it."

The Skeptic

The small delivery boy was delivering to a new customer and had encountered a huge dog in the yard.

"Come in," said the lady, "he doesn't bite."

The boy still hung back. "Does he swallow?" he asked.

Young Girl (shopping): "Where can I get some silk covering for my settee?"

Floor Walker: "Next aisle and to your left for the lingerie department, Miss."

There's been a story going around about the absent-minded professor and his absent-minded wife.

It seems that the professor had just come home from a hard day's work and after dinner he and his wife settled down in the living room to enjoy the radio. Suddenly there came a sharp knock on the door. "My husband!" the absent-minded wife gasped. "My God," said the professor and jumped out of the window.

"That will be enough out of you," said the doctor as he stitched the patient together.

Lady Golfer: You'll drive me out of my mind!

Caddy: Lady, that wouldn't be a drive—that'd be a putt.

Young Man: "Sir, I want your daughter for my wife."

Father: "And I, sir, am not willing to trade."

Two young boys were discussing Sunday school.

One of them said, "Jim, do you believe all this funny stuff they teach us about the devil?"

The other one said, "No, there ain't no devil. It's just the same as Santa Claus—it's your father."

A Kansas farmer stopped at a bank to see if he could get a loan on his farm.

"It might be arranged," said the banker. "I'll drive out with you and appraise it."

"You won't need to bother," said the farmer, noticing a huge cloud of dust rolling up the road. "Here it comes now."

Tramp: It ain't that I'm afraid to work, ma'am, but there ain't much doin' in my particular line.

Housewife: Why, what are you?

Tramp: I'm a windowbox weeder, ma'am.

Little Quentin, aged six, was being congratulated by his teacher.

"I hear you have a new baby brother."

"Not only one," grunted Quentin. "Two of them."

"That's wonderful," beamed the teacher. "You must be very proud."

"Aw, what's so hot about it?" growled the boy. "We didn't even make the newsreel."

Pop—"Well, I received a note from your teacher today."

Son — "Honest, Pop? Give me a quarter and I won't breathe a word about it."

"When you asked her to dance did she accept quickly?"

"Did she? Why, she was on my feet in an instant."

Covic Diesel Pacific Company

Pacific Coast assembly and sales plant for Covic diesels at Glendale, California.

Covic Diesel Engines are now being made available for the industrial, marine and automotive fields through the Covic Diesel Pacific Co., which firm has recently moved into extensive quarters at Glendale, California. Distributors are being appointed through the Pacific states, as well as Montana, Wyoming, Colorado, Arizona, and Texas.

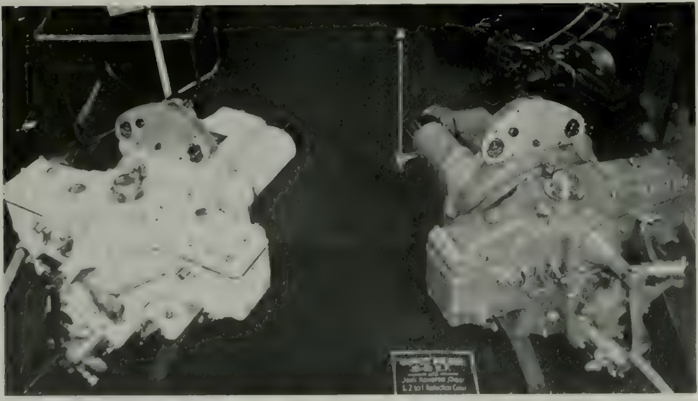
The Covic diesel is a four cycle, two cylinder opposed, full diesel engine of the cold starting, solid injection type. Its speed range is from 500 to 3500 r.p.m., and it is rated at 15-18 H.P. for normal operations at 1875 r.p.m. to 2600 r.p.m. Width is but 30 inches, height 19½ inches, length 19 inches. Weight of the basic engine is but 280 pounds, including a 60 pound steel flywheel.

This engine is the development of the Victor Oil Engines, Ltd., Coventry, England, who entered into mass production of the Victor Cub Diesel, as the Covic is known in Europe, in 1934. Their plants have delivered thousands of the Covic engines throughout the world for all types of marine, stationary, and vehicle service. This engine has been adopted by the French, British and Polish navies. The Covic diesels are now built under license from Victor Oil Engines, Ltd. in England, France, Switzerland, and Holland, and at an early date a leading American motor manufacturer will be in full production on them. In the meantime the Covic Diesel Pacific Co. will supply their distributors with the English built engine equipped with American built accessory equipment such as generators, clutches, pumps, and compressors.

Covic diesel engines make possible entirely new applications for diesel power, due to their light weight, small size and adaptability to widely varied services. Available are complete generating plants of either the hand starting or fully automatic types; power units with various forms of power take-offs; small compressor and pumping sets; both straight and reduction gear drive marine engines; and a complete line of vehicle engines for light, city delivery types of trucks, as well as for small industrial tractors.

The Covic Diesel Pacific Co.'s plant at 530 Riverdale Drive, Glendale, includes general offices, show rooms, service departments and complete assembly and testing sections. The bare engines will be assembled for various duties at this plant, and both parts and complete units will be warehoused at San Francisco, Seattle, Salt Lake City, Denver, and Fort Worth, to make possible immediate deliveries through the distributor organization.

James Garney, well known diesel expert, is president of the Covic Diesel Pacific Co. In charge of service is Harvey Miller, for years prominent in motor manufacturing circles in Detroit. Chief engineer of the engine company is Richard Watson, who is responsible for much of the early work in high speed diesel development in this country, and brings with him an extensive background of experience in the diesel field.



Two Covic diesels. These engines generate 15 to 18 H.P., weigh 280 pounds.

PACIFIC MARINE REVIEW

EBRUARY
938

The S. S. Matsonia

. . . . There's
guesswork about
QUALITY
SILVER *like*

Of course it's fine silver . . . fine in qua
craftsmanship. Even a novice judge could
immediately.

But there are other products—many used in the marine field—that are
easily judged as to their quality.

Such a product is rope.

Without the most exacting tests and expert knowledge, the average
tell little about rope and its ability to stand up under the grueling wor
be called upon to perform.

Keen rope buyers recognize this fact. They realize that their best guara
quality and faithful performance is the reputation and leadership of the
makes the rope.

Most of the marine lines of the Pacific are equipped with Tubbs Extra
Manila and Supercore. Their operators and crew know that they ar
placing their confidence in an organization that for 82 years has main
leadership in the marine field.

TUBBS
ROPE

TUBBS *Cordage Company*
200 BUSH STREET, SAN FRANCISCO

PACIFIC MARINE REVIEW

EBRUARY 1938
OL. XXXV NO. 2

CONTENTS

Editorial Comment:

Shipping and Shipbuilding Prospects 29

S.S. W. H. Berg 30
First of the new American built tankers for the Standard Oil Company of California.

Automatic Combustion Control on Tanker 40

Matsonia the Magnificent 42
By A J Dickie.

Radio Progress in 1937 50
By David Saranoff.

Decks that Cover the Ships that Cover the World 51

Your Problems Answered 52
By "The Chief".

For American Deck Officers 54

Radio Telephone from Ships at Sea 56

Port of New Orleans 58

On the Ways:

Latest News from American Shipyards 61
Building in American Yards 64

1938 Lifeboat Winch 76

Miscellaneous: Engineers' Licenses, 53; Deck Officers' Licenses, 54; Change of Masters, 55, How Marine Insurance Saved the Whaling Business, 67; Errors of Radiobeacon Bearings, 68; Literature of the Industry, 78; Collisions with Lightships, 84.

The Brigantine Lurline

Our frontispiece this month is a reproduction of the spirited painting which adorns the wall of the main dining saloon on the Matson liner Lurline. It depicts the brigantine Lurline, Captain William Matson's first ship, built for the San Francisco-Hawaii run. She was launched at the Matthew Turner yard, Benecia, in the spring of 1887. This vessel, handled by Captain Matson himself, operated many years on the Honolulu run and earned good dividends.

Her chief characteristics were.

Length	135 feet
Beam	34 feet
Displacement	1320 tons
Gross	359 tons
Passenger capacity	12
Cost	$32,000

UBLISHED AT 500 SANSOME STREET . . . . SAN FRANCISCO

ntered as second class matter June 20, 1913, at the post office, San Francisco, under the Act of March 3, 1879. Published on the 1st of each onth Advertising and editorial forms close on the 15th. Subscription price, one year: Domestic, $1.50; foreign, $2.50; two years: Domestic, 2.50; foreign, $4.00; three years: Domestic, $3.00; foreign, $5.50; single copies, 25c. Chas. F. A. Mann, Northwest Representative, 1110 uget Sound Bank Bldg., Tacoma, Washington. New York Office, Suite 404-405-406, Two Hundred Broadway, Telephone COrdlandt 7-3579

n New York City copies of Pacific Marine Review can be purchased at the news stands of I Goldberg, 42 Broadway; Jacob Fuchs, 17 Battery Place: Philip Mandara, Greenwich Street and Battery Place at 25c per copy.

J. S. Hines
resident and Publisher

B. N. DeRochie
Assistant Publisher

Alexander J. Dickie
Editor

Paul Faulkner
Advertising Manager

F. Dryden Moore
Assistant Editor

PACIFIC MARINE REVIEW
VOLUME XXXV FEBRUARY 1938 NUMBER 2

Encouraging Prospects for Shipping and Shipbuilding

Both in Pacific Coast Shipping and in Pacific Coast shipbuilding prospects on the 1st of February are much brighter than they have been for some time back.

We are carrying this month a description of a half-million dollar reconditioning job recently delivered to the Matson Navigation Company by the San Francisco Works of the Union Plant of the Bethlehem Shipbuilding Corporation Ltd.

This new Matsonia gives the Matson Navigation Company four practically interchangeable vessels that are equals in appearance, in speed, and in luxurious comfort.

With Matsonia and Lurline the Matson organization maintains a weekly service covering San Francisco-Los Angeles-Honolulu. With Monterey and Mariposa a sailing every fourth week is maintained, covering San Francisco-Los Angeles-Honolulu-Pago Pago-Suva-Auckland-Sydney and Melbourne.

This quartette of fine liners will, on regular schedule, cover nearly half a million sea miles per year at a faster speed than is maintained by any other four ships operated under the American flag by one organization. All of them can make 22 knots easily and all of them can shade 23 knots on a spurt.

Both of these services are exclusively Pacific Ocean services, built up by the initiative and enterprise of citizens of San Francisco through two generations, and San Francisco should be proud to be their home port.

Our frontispiece depicts the brig Lurline, Captain Matson's first ship and the genesis of the powerful fleet of the Matson Navigation Company. As one looks at this lovely white winged ship in the light of all that has transpired since she first started regular service between San Francisco and Honolulu one cannot help being impressed with the great possibilities of future commerce on the great trade routes of the Pacific Ocean.

Also in this issue we carry a description of the new tanker W. H. Berg, which was delivered to the Standard Oil Company of California early in January by the Sun Shipbuilding and Dry Dock Company of Chester, Pennsylvania. This vessel will be followed in a few weeks by a sister vessel, the H. D. Collier.

These deliveries, going immediately into Pacific Ocean service, will somewhat pep up shipping on our Pacific Coast waterfronts.

On January 3 the Standard Oil Company of New Jersey, together with the U. S. Maritime Commission, signed contracts with four Atlantic Coast shipyards for the construction of 12 large tankers figured for 18 knot trial speed on a horsepower of 12,800 and at a total cost of $37,556,000, of which the Maritime Commission will pay $10,563,000.

On February 1 the bids will be opened on 12 of the standard C-2 design cargo vessels for the U. S. Maritime Commission. On these 12 vessels three Pacific Coast yards are bidding with good chances of getting some of the ships.

On February 10 bids will be opened on a tanker for the Union Oil Company, Los Angeles. Three or four Pacific Coast yards are bidding on this job.

Other jobs on which Pacific Coast yards are bidding include a large shallow draft cargo motorship for San Francisco Bay service and a large fisheries research vessel for the California State Bureau of Fisheries.

(Please turn to page 61)

"Let's Start Rebuilding Our Merchant Marine in 1938"

S.S. W. H. Berg

First of the New Tankers for the

During the night of January 24 the new tanker W. H. Berg, built for the Standard Oil Company of California at the Sun Shipbuilding and Dry Dock Company, Chester, Pennsylvania, entered the Golden Gate and moored alongside Pier 39, Port of San Francisco. There, on the following day, she was inspected by a large group of interested engineers, naval architects, and shipping men, all of whom expressed high approval of the design and workmanship.

This ship is of especial interest to the Pacific Coast because she is the first tanker built for Pacific Coast interests by the Sun yard and the first tanker designed for Pacific service built in an American yard for many years.

The Sun yard has built up a wonderful reputation for good workmanship and technique in tanker construction, and the inspecting experts were looking for something unusual along these lines. They were not disappointed.

The Sun Shipbuilding and Dry Dock Company technical organization is composed of practical experts under the supervision of men who represent the best in British ship design and ship construction experience.

Vice-president and general manager of the Sun yard Robert Haig was brought up on the Clyde, as was also G. McConechy, chief engineer.

Principal Particulars

HULL

Length, overall	459 ft. 6 ins.
Length, between perpendiculars	442 ft. 0 ins.
Breadth, molded	65 ft. 0 ins.
Depth, molded to upper deck at side, amidships	35 ft. 0 ins.
Sheer, forward (at F.P.)	10 ft. 0 ins.
Sheer, aft (at A.P.)	5 ft. 0 ins.
Camber, upper deck	16 inches
International tanker summer draft to bottom of keel	28 ft. 7 13/16 ins.
Displacement, molded, at international tanker summer draft	17,320 tons
Deadweight, at international tanker summer draft	12,800 tons
Gross tonnage	8,298.4 tons
Net tonnage	4,934 tons
Cargo capacity, 98% full	103,417 bbls.
Fuel capacity, 98% full	10,471 bbls.
Fresh water capacity	271 tons
Speed, loaded, on trial	13.64 knots
Cruising radius	20,000 miles—65 days
Normal crew	37 men

MACHINERY

ENGINE: Single screw Westinghouse cross compound turbine with double reduction gear.

High pressure unit	5097 R.P.M.
Low pressure unit	3592 R.P.M.
Shaft horsepower, normal at 85 R.P.M.	3500 H.P.

Propeller 18 ft. 0 ins. dia. x 16 ft. 0 in. pitch.

MAIN BOILERS:

Two Babcock & Wilcox, water tube with superheaters and de-superheaters.

Total heating surface, each	3596 sq. ft.
Working pressure	425#/0" G
Total heat	710° F.

CARGO BOILER:

Babcock & Wilcox, without superheater.

Total heating surface	4200 sq. ft.
Working pressure	425#/0" G
Pumping capacity (four pumps)	12,000 bbls./hr.

HISTORICAL PARTICULARS

Contract signed	December 16, 1936
Keel laid	April 23, 1937
Launched	December 14, 1937
Trial trip	December 28, 1937
Delivered	December 31, 1937

American Built Standard Oil Co. of California

ohn W. Hudson is an Englishman rom the famous shipbuilding disrict of Newcastle-on-Tyne. When . Howard Pew, president of Sun, tarted this great shipyard in 1916 e brought in Robert Haig, then rincipal surveyor for Lloyd's at Philadelphia, and John W. Hudson, hen with Newport News, after six ears of American shipyard experince with that yard and with the New ork Shipbuilding Co. The organizaion of the Sun yard was built up round these two men. In the 21 ears since its founding these men nd their organization have been reponsible for the design and contruction of over 170 vessels. The anker W. H. Berg, which we are now nspecting, is their hull number 166. Her sister ship for the same ownrs, which was launched on January 9 and christened H. D. Collier, will be delivered late in February.

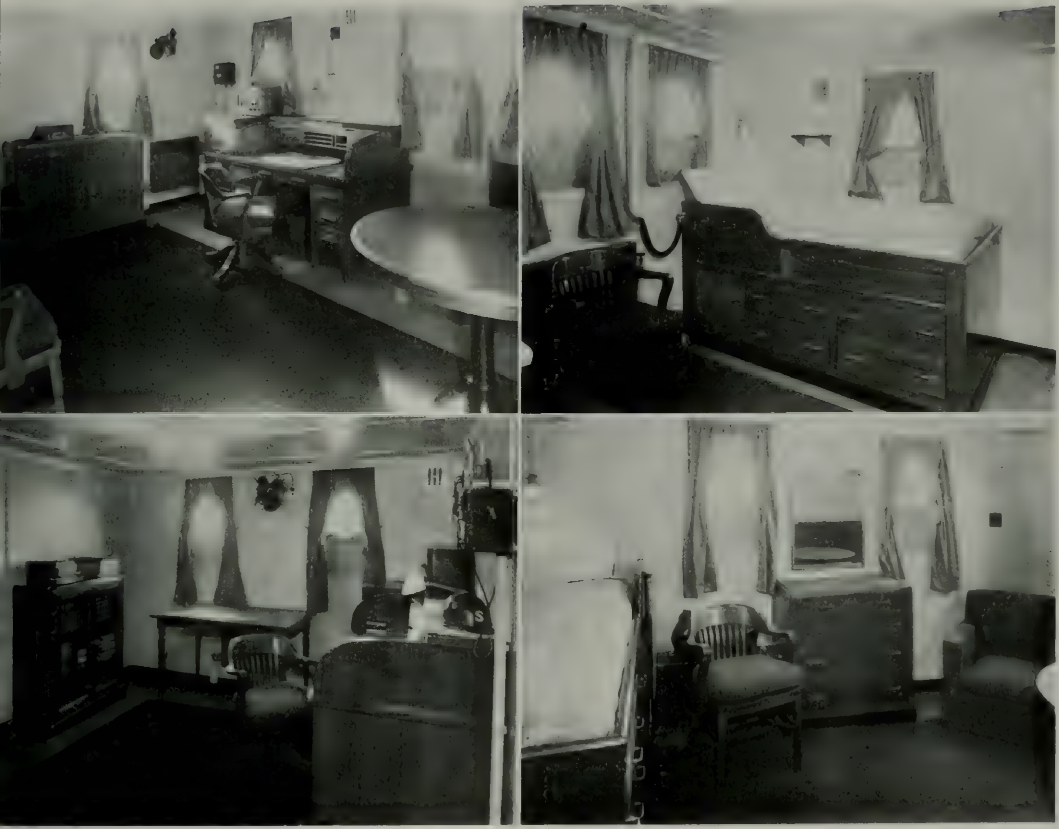
These ships, however, were by no means entirely designed and arranged by Sun Shipbuilding Company. In all details in which they differ from the ordinary design of tanker they are the product of the marine department of the Standard Oil Company of California, and we shall see as we inspect the W. H. Berg that in many respects they are designed especially to take care of the Pacific Ocean trades of that corporation. Since the requirements of these trades are often very different from those of the Atlantic oil distributing trades, we will find many differences in equipment and design.

The lines of this hull were developed after considerable experimental work with models in the towing basin at Washington, the object being to create a form for the underwater body that would combine good propulsive efficiency with maximum volumetric capacity in cargo tanks. It is considered by experts quite a feat from the naval architects' viewpoint to have designed a ship of this length that will carry 103,417 barrels of cargo oil, 10,471 barrels of fuel oil, a 3,500 horsepower propulsion

Broadside view of the new tanker W. H. Berg, Standard Oil Company of California.

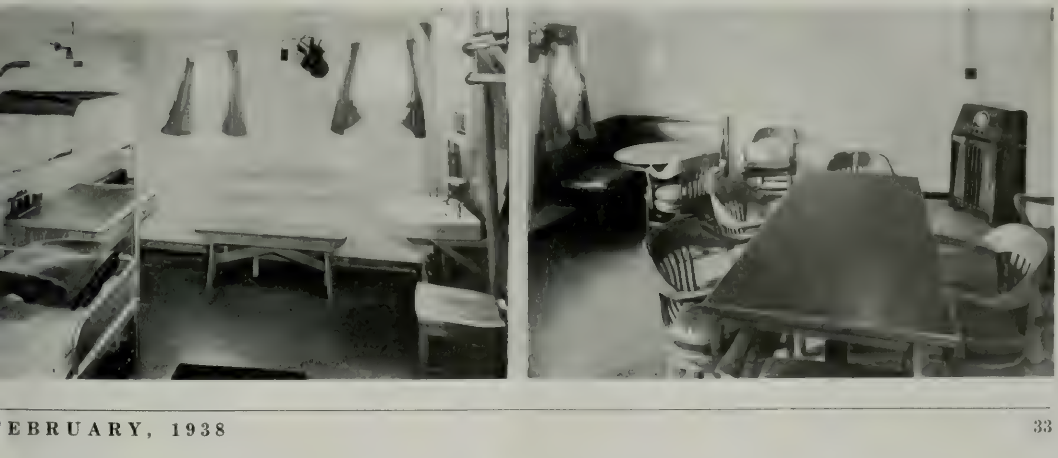
W. H. BERG

President, Standard Oil Company of California



The accommodations for officers and crew on board the new tanker W. H. Berg are equal or superior to those provided for first class ssengers on many passenger liners. On this page we show a few samples.

Upper left is the captain's office. Upper right is the captain's bedroom. Center left, the chief engineer's office. Center right, the ief engineer's bedroom. Below, at left, a typical seaman's stateroom, two seamen in the space legally allowed for seven. These rooms are l piped with hot and cold fresh water. Note the porcelain wash basin with medicine cabinet above, ventilating fan, two large portholes, indi- dual reading lights for each berth, radio connections. Below, at right, a corner of the crew's recreation room.



plant, and a 12,000 barrel an hour cargo pumping plant. Few tankers afloat can equal this relative capacity.

The structural details of the hull are all on the Isherwood Bracketless system, and were designed for riveting of shell and deck plating and for welding of all interior joints. The weight saved by welding is put into heavier sections in those members of the hull most subject to corrosion, thereby greatly reducing maintenance and prolonging the useful life of the hull.

There are eight thwartship cargo spaces divided by two wing bulkheads into three tanks each, or a total of 24 cargo tanks. Stiffeners on wing bulkheads are all outboard, leaving smooth bulkheads port and starboard on the main central cargo tanks. These main cargo tanks all measure 34 feet in the length and 36 feet in the beam, with the exception of tank No. 5,in which the cargo pump room is installed within those dimensions. The wing tanks all measure 34 feet in length by 14 feet 6 inches in the beam.

The hull is of single screw, single deck type, with forecastle, bridge and poop erections connected by an elevated walkway of the normal type. The stem is round nosed with a jaunty forward rake, and the stern of modified cruiser type.

As we look at this ship even when moored at the dock there is a certain feeling of liveliness and power in her appearance, which is all the more noticeable because it is not usual in tankers. Careful analysis of the profile will show that this appearance is due to properly designed sheer line of the hull and rake line of masts and funnel. The rake is progressive from stem aft, being ⅜ inch to the foot on the foremast, ¾ inch to the foot on the mainmast, and ⅞ inch to the foot on the funnel.

The table reproduced herewith gives the principal particulars of the W. H. Berg, and the reader is referred thereto before proceeding with inspection of the ship.

Walking aboard we find ourselves on the upper or main deck just about amidships. The first thing that attracts our attention is the maze of pipes running lengthwise of the vessel under the elevated walkway that connects the bridge, poop, and forecastle erections. These pipes include steam pipes for the cargo pumps and for the winches, mooring engines, and windlass, a six inch fire main, hot and cold fresh water pipes, salt water sanitary system, hot salt water system for tank cleaning, and filling connections for various water tanks. These are all arranged in neat shipshape Bristol fashion and leave the deck space comparatively free of obstruction.

A tanker is somewhat different in its problems of design, construction and operation than any other craft on the sea. Note the deck on which we are standing. All of it that is visible from the break of the poop to the break of the forecastle covers a continuous succession of cargo tanks, with the exception of one small pump room amidships. When loaded to her marks this deck is only a few feet above the water, and seas of any size wash right over. The surplus buoyancy in these ships is almost wholly in the two cofferdams, and in the spaces under poop and forecastle.

Everything on a tanker's open deck must be secure against the full force of the sea, and from the nature of the cargo extreme precautions must be taken against the hazard of fire. Just opposite as we come aboard is a battery of eight large Chapman gate valves, which are arranged for shore connection for cargo discharge or loading. On the opposite side of the ship is another battery of these valves with pipe connection between, and these cross over pipes are connected to the cargo pumps. These valves are just aft of the small house erection covering the pump room. Just forward of this house is another single discharge pipe with valves for short connection port and starboard.

● Pump Room.

Climbing down to the ship's bottom we are shown the cargo pumps. Four big main cargo pumps and one stripping pump are installed, each driven by a steam turbine, the group having a combined capacity to discharge cargo at the rate of 12,000 barrels an hour. In other words, these pumps can discharge the full load of 103,400 barrels in less than nine hours. The pumps are Northern rotary type driven by Whitton turbines. Suction and discharge piping connected to these pumps are arranged so as to give complete control for pumping four different petroleum distillates without danger of contamination.

Climbing out on deck again we note with interest aluminum fittings projecting above the deck at many points, and are informed that these are the tape gages and vacuum vent valves manufactured by Shand & Jurs of Berkeley, California. On a steel tape visible through a small window these fittings show the exact height of oil in the cargo tanks and make unnecessary the so-called ullage openings which are in use on most tankers for keeping track of the space above the oil cargo. The same Berkeley firm has equipped this vessel with their flame arresters and with their gas freeing ejectors, a very useful device which drives gas out of cargo tanks much more effectively and quickly than can be done by the wind or the steaming methods.

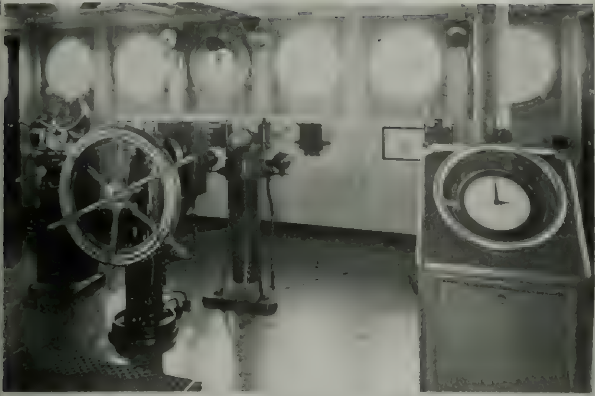
Fittings are also installed on the deck for the Butterworth System of cargo tank cleaning. This system cleans the crude oil residue out of tanks by a whirling spray of hot salt water. A special Davis Paracoil heater and the Worthington fire pump serve these Butterworth nozzles.

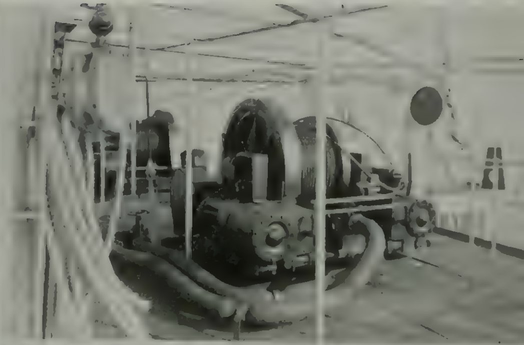
All the cargo tanks are piped with the Standard Oil system of filling spaces over oil cargoes with washed and cooled flue gases to prevent fire.

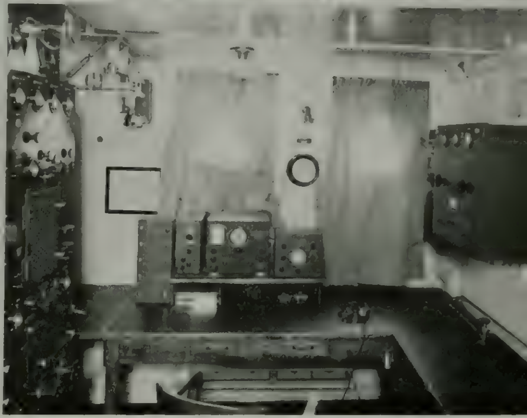
● Crew Accommodations.

Our guide now walks us aft to the poop and we enter the seamen's quarters on the starboard side of the ship. Here began an increasing wonder at the first class hotel rooms which are provided for the entire personnel. The first room is furnished to take two seamen and is so designated on the marker plate in the passageway over the door. The edge of the plate inside the door is stamped by the Marine Inspection Bureau "certified for seven seamen." That indicates that the cubic space included in this room is enough to satisfy the legal requirements for seven persons.

Can this be a seaman's room? This neatly paneled compartment with walls enameled in a beautiful olive green, ceilings in cream? Against one wall is a porcelain wash basin with chromium fittings for hot and







Upper left: The pilot house on tanker W. H. Berg, featuring Sperry Gyro Pilot and Compass, American Engineering telemotor, Bendix ngine room telegraph, and Kolster radio direction finder. All of these circular windows are provided with automotive type windshield ipers, and one with the Cory-Bendix-Kent clear vision screen.

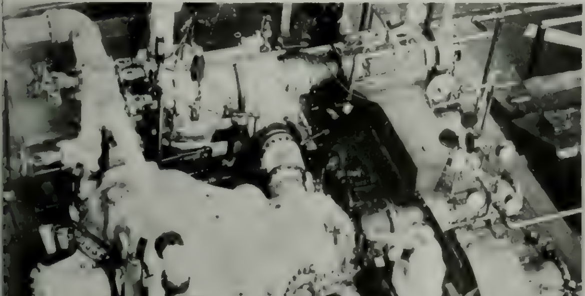
Upper right: Two of the five American Engineering Company's towing engines, which are installed on this ship as mooring winches.

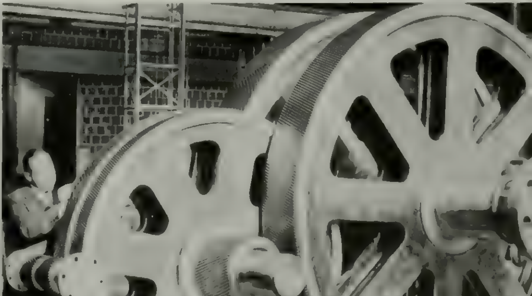
Center left: The chart room, featuring the Sperry Master Gyro Compass.

Center right: The radio room, with latest type Mackay sending and receiving apparatus.

Lower left: The turbines of the W. H. Berg on the test floor at the Westinghouse Electric & Manufacturing Company plant, shown ully assembled with gears connected but without lagging on the turbines.

Lower right: Rotating elements of the speed reducing gears of the propulsion plant of the W. H. Berg.





cold fresh water. Here are: A neat writing table with a triple outlet on the wall for individual radios and reading lamp; two comfortable chairs and a bench; two large port lights; a medicine cabinet; two large lockers; a Simmons type steel frame assembly of two berths each fitted with a deep spring filled mattress; and on the wall at the head of these berths, individual reading lamps.

The color scheme in these accommodations is uniform throughout the ship, and is unique in crew's quarters so far as our knowledge goes. All the passageways are buff; the rooms, light green walls with cream ceilings. If we know anything about psychology such a color scheme should aid greatly in keeping a better morale in ship's crews. It does not cost any more than white, and probably would cost less for maintenance, and it certainly is much more restful and cheerful to the occupant of the room.

A little farther down the passage on this side of the poop we find the seamen's washroom with two fine shower baths and two toilets. Twelve seamen are housed in six rooms on this side of the poop on the main deck level.

● Refrigeration.

At the after end of the passage we find on the outboard side a gas proof steel door leading into the refrigerating machinery, and on the inboard side three insulated chambers for refrigerated stores. One small box is for utility purposes; one of 560 cubic feet capacity is for vegetables; and the third, of 775 cubic feet capacity, is for meats.

The refrigerating machinery to take care of these boxes comprises two Carrier 2½ ton motor driven units of the direct expansion type, each unit being a self-contained plant.

Aft of the reefer boxes are a compartment for cordage, and steward's dry store rooms. On the port side of the poop at this level are quarters for firemen, oilers, and wipers, practically identical to those just described for seamen. These rooms are so good that one begins to wonder just what will they do to make the officers' rooms any better. The illustrations accompanying this article show far better than words just how fine all the rooms are, and it would be tedious to describe them all in detail.

Officers' rooms are, of course, more individualized and are uniformly in mahogany furniture and trim, in contrast to the birch furniture provided for the unlicensed personnel. However, the generous provision of baths and toilets is the most striking feature of these accommodations. The normal personnel of the W. H. Berg is 37. For this number she provides 15 baths (showers), 16 toilets, and 29 wash basins. How many passenger vessels built 15 years ago or more supplied plumbing for first-class passengers in anything like that ratio?

The galley, laundry, and bakery, the officers' mess and the crew's mess are equipped and furnished like those rooms as one would normally expect to find them on a small passenger liner. An interesting feature in this galley is the Ray Oil burning range supplied by the Ray Oil Burner Co. of San Francisco. Just forward of the crew's mess room is a fine lounging room for the crew, fitted with writing table, two card tables, a fine radio, and easy lounging chairs. As is amply shown in the illustrations, these crew's quarters strike a new and an advanced note for cargo vessels. The management of the marine department of the Standard Oil Company of California deserves great credit for the introduction of more color into the living quarters of ships' officers and crews.

● Fire Protection.

At strategic locations throughout the accommodations we note Pyrene fire extinguishers in their clips ready to smother out any small blaze. Down on the steering flat we find 28 CO_2 cylinders installed by the C-O-Two Fire Equipment Company, and following the pipes from their manifolds we discover that they are all hooked up to take care of any fires that may get loose in the engine room or on the boiler flat. These cylinders may be discharged from either of two control stations by means of direction valves. One of these stations is in the port side passage on upper deck level and protects the engine room. The other is alongside the operating stand in the engine room and protects the fire room.

● Steering Gear.

While we are on the steering flat the gear for turning the rudder attracts our attention. This is of the electro hydraulic type built by the American Engineering Company. Its hydraulic rams are actuated by Hele-Shaw pumps driven by General Electric motors under control of an electric telemotor actuated by either the handwheel or the Sperry Gyro Helmsman in the pilot house. It looks powerful enough to handle any rudder in any weather.

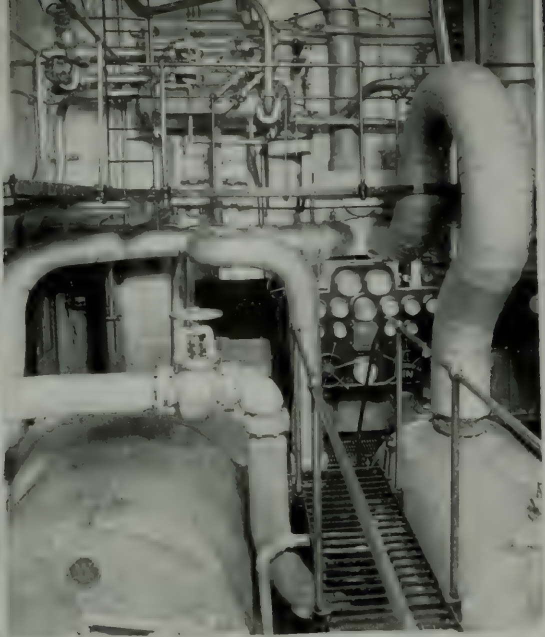
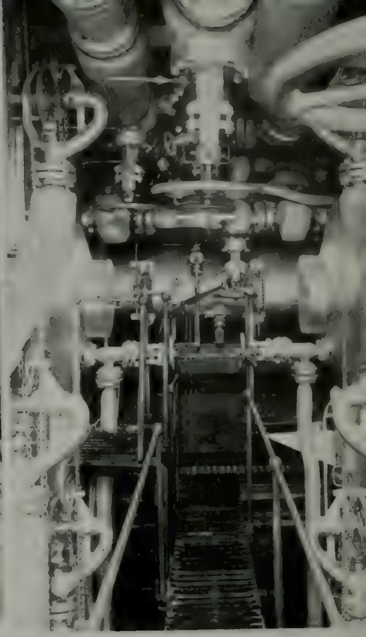
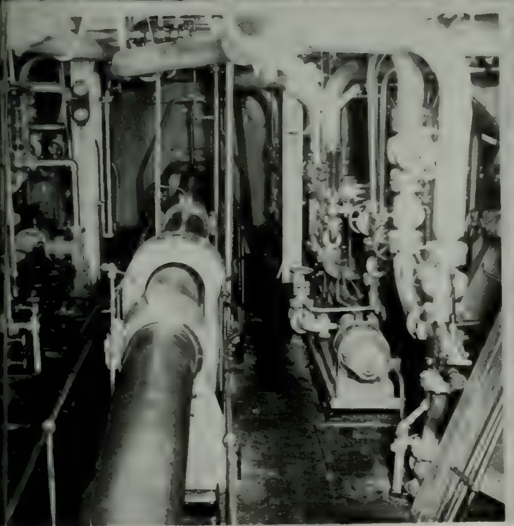
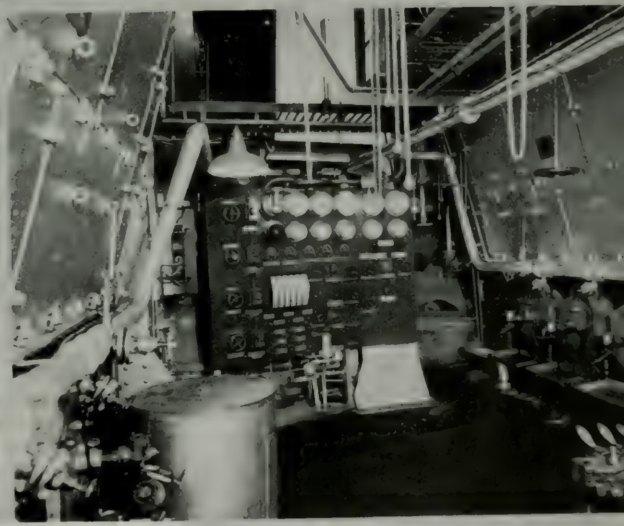
The American Engineering Company also furnished for this vessel the steam windlass, five steam mooring engines, one warping winch, and two cargo winches. These mooring winches are an innovation in Pacific Ocean tanker operation. Ordinarily tankers on this Coast use manila hawsers and capstans for mooring. Standard Oil Company experience indicates that manila hawsers wear out quickly not so much from actual service in mooring but from handling. The new mooring engines are typical towing winches and will use wire hawsers which will be kept coiled on the drums. While moored, the steam cylinders will keep a predetermined strain on the mooring cables. This system has been standard for some years on the Great Lakes tanker fleets.

● Navigating Equipment.

On the upper deck level the bridge erection is used to house the larger spares, such as spools of heavy wire rope on frames. Port and starboard back of screen bulkheads are large fresh water tanks each with a capacity for 17½ tons. On the deck above are rooms for first, second and third officers, for the steward, two spares, four bathrooms, and the ship's hospital.

The upper bridge deck houses the captain's suite, the radio room and the radio operator's room. The captain's rooms include a large office, a large bedroom and a bathroom. Office and bedroom occupy the entire forward end of this house so that they have air and sunlight on three sides.

In the radio room we find the most modern equipment supplied by the Mackay Radio and Telegraph Company. This includes: a 500 watt combination intermediate and high frequency transmitter; an all-wave Type 117-A receiver and a crystal receiver; a Type 101-A radio auto

SNAPSHOTS IN ENGINE ROOM

Upper left: The generator flat in the engine room of tanker W. H. Berg.

Upper center: Maneuvering platform, showing tops of low and high pressure turbines.

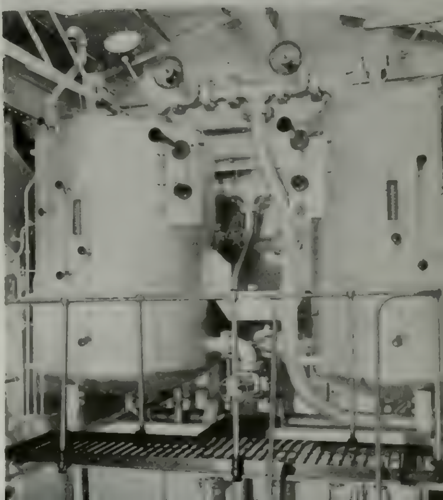
Upper right: View between the inboard sides of two boilers, showing soot blowers, steam piping and valves.

Center left: Looking aft along the propeller shaft, with fuel and lubricating oil pumps on each side.

Center right: Firing platform, showing fronts of two boilers and the automatic combustion control board.

Lower left: Working platform in the pump room, steam turbine driven rotary pumps with a capacity of 12,000 barrels of oil per hour.

Lower right: Lubricating oil gravity tanks.



alarm; and a Type 142-A 500 watt emergency transmitter with current supply from an Exide Type M.V.A.-13 six volt storage battery.

On the deck at the starboard side of this house we note an electric sounding machine supplied by the A. Lietz Company of San Francisco.

Atop of the bridge erection is the navigating bridge with the wheelhouse and chart room. In the chart room is located the Sperry Master Gyro Compass of the new type with thermionic (non-contact) type follow up system. This master unit controls three bearng repeaters, one steering repeater, and one radio-direction-finder repeater.

In the wheelhouse there are many necessary and useful gadgets for insuring good navigation. Here is the Fathometer, supplied by the Submarine Signal Company. This instrument will give almost constant indication of changes in depth of water under the ship's keel. An electrically operated hammer in the bottom of the ship taps out signals whose echo from the bottom of the sea is picked up on a microphone. The time interval is measured and converted into fathoms on the scale. In shallow depths the indication is practically continuous.

Another gadget turns out to be a very neat switchboard supplied by Russel and Stoll for the control of the running lights.

Here, too, are the Sperry Course Recorder, Sperry Rudder Indicator, Sperry Incandescent Searchlight, and Sperry Gyro Pilot. This last is of the two unit type, the control unit being alongside the handwheel in the wheelhouse, and the power unit at the steering engine. When a ship is set on a certain course and the helm turned over to the Gyro Pilot, she is held to straight line steaming much closer than could be possible with manual steering. She therefore steams a shorter distance between two given ports and saves in ship's time and in fuel consumption.

Wheelhouse and captain's office are connected by telephone with several points on the ship. Henschel marine telephones are used. This maker supplied also the shaft revolution indicator.

Prominent in the wheelhouse is the radio direction finder of the new Kolster type, made and installed by the Mackay Radio and Telegraph Company. Orders to the engineer on watch are transmitted by Bendix Marine Products Company engine telegraphs. One of the window ports of this wheelhouse is fitted with the famous Bendix-Kent Clear Vision screen, and all the other windows have wipers of the automotive windshield type.

Outside the door we note on the rail an old friend—Walker's Patent Ship's Log Cherub No. 3. Walker logs have been accurately recording the speed of ships for over three-quarters of a century.

Four Welin 30 person lifeboats swung on Welin quadrant type davits, two on the bridge and two on the poop, insure ample provision for room in boats for the entire personnel of the ship from either port or starboard side.

● Steam Generating Plant.

Strolling along the tanker walk we note on the deck below a large spare propeller—four-bladed, solid type, manganese bronze—from the Cramp Foundry, and this reminds us that we have yet to inspect the propulsion machinery of this fine craft. Since this is a steam driven ship, the logical order of inspection is to look first at the boilers which produce the steam. These are located on a flat or half deck in the machinery space under the poop and are above and aft of the propulsion machinery.

The steam generating equipment consists of three B. & W. boilers, two of which will be used for propulsion, and the other for steam requirements in port. The boilers furnishing steam for propulsion are of sectional - header, single - pass type, and are equipped with air heaters, and steam superheaters. They will operate with a steam pressure of 425 lb. and steam temperature of 725° F. at the superheater outlet. The steam capacity is 17,000 lb. per boiler per hour. Each will have 3,596 sq. ft. of heating surface.

The superheaters are of interdeck type and are arranged with the tubes running transverse to the boiler tubes. The superheater headers are located between the outer and inner boiler casings and are thus readily accessible. Four rows of boiler tubes between the superheater and the furnace protect the superheater tubes from direct flame impingement from the oil burners. Steam desuperheaters of the internal-drum type furnish low temperature steam when required for auxiliary purposes.

The boiler for port use is of the same general dimensions and design as the others and is equipped with an air heater. As it furnishes saturated steam only, for tank cleaning and cargo pumps, it has no superheater, but has a heating surface of 4480 sq. ft. The steam capacity is 33,700 lb. per hour.

The furnaces of the three boilers have water-cooled side walls consisting of a vertical row of inclined tubes expanded into headers at the front and rear of each wall. These tubes are of B. & W. Stud-Tube construction in which studs welded to the face of the tubes on the furnace side hold securely a covering of chrome plastic refractory on the face of and between the tubes, which not only resists the high furnace temperatures incident to oil firing, but also the slagging action that would be encountered with ordinary refractory. With this single-pass boiler design, no baffling to deflect the gases over the different sections of the heating surface is necessary. The omission of baffles in the air heater provides a straight gas-flow, and eliminates ledges or pockets where soot would collect and which might be a fire hazard as well as a corrosion hazard.

The boiler is encased in a double casing so arranged that all the air for combustion passes around the boiler casings and headers, reducing heat loss to a minimum and maintaining a cool fire room.

The burners used in this boiler installation are the famous Todd "Hexpress" mechanical atomization type supplied by the Todd Combustion Equipment Co. Fuel oil under pressure is pumped to these burners by two Northern rotary pumps each driven by a General Electric motor. The oil from each pump on its way to the burners passes through a Davis Engineering Company fuel oil heater.

All the boilers are fitted with a

sufficient number of Diamond Soot Blowers to maintain a clean heating surface at all times.

An interesting feature of the fire room is the Hagan combustion control, which automatically keeps the oil fuel and the combustion air at the proper proportions. This system is described in detail in an article on Page 40 of this issue.

● **Propulsion Machinery.**

Steam from these boilers is supplied to Westinghouse cross compound turbines which drive the single screw shaft through Westinghouse double reduction gearing. Normal speed for the high pressure rotor of this turbine is 5097 revolutions per minute, and for the low pressure rotor is 3592 revolutions per minute. These speeds are reduced to 85 revolutions per minute on the propeller shaft. The normal output at these speeds is 3500 shaft horsepower, which on trials gave the vessel a speed of 13.64 knots loaded. A Kingsbury thrust bearing on the forward end of the low speed gear shaft takes the thrust of the propeller shaft.

The low pressure unit of this turbine is mounted on top of and exhausts directly into a Westinghouse two pass condenser of 4700 square feet cooling surface designed to maintain a vacuum of 28½ inches under normal conditions obtaining on this ship. This condenser is served by Westinghouse air ejectors with inter and after condenser.

Cooling water for the main condenser is supplied by a Worthington centrifugal vertical shaft pump driven by a General Electric motor and having a capacity for approximately 6000 gallons a minute.

Lubricating oil for turbine and gear bearings is supplied by two Northern rotary service pumps, cooled by two Davis Engineering Company lubricating oil coolers, and cleaned by a De Laval centrifugal oil purifier of the latest type, all motor driven.

Condensate and make up feed water on its way to the boilers passes through a first stage heater of the Worthington deaerating type, and through a second stage heater supplied by the Davis Engineering Company. Three feed pumps are installed—all Worthington. Two of these pumps are centrifugals driven by

(Page 82, Please)

. . . . *Automatic* Combustion Control on Tanker

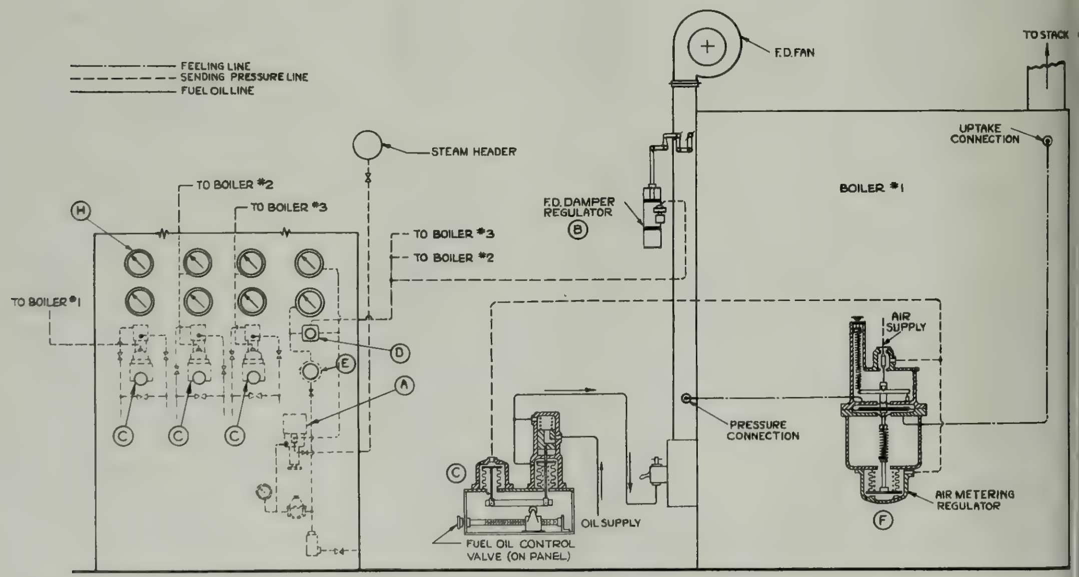
Automatic combustion control has but one fundamental purpose, whether it be installed in a stationary plant or on shipboard. This purpose is the continuous adjustment of the supply of fuel and air in the proper ratio to each other, at the same time maintaining the rate of steam generation in accordance with the load demands of the steam consuming equipment. Installation on shipboard, however, requires that the combustion control system shall be as simple and direct-acting as possible. It must be free from delicate adjustments for proper calibration, and the equipment must stay in adjustment over a long period of service.

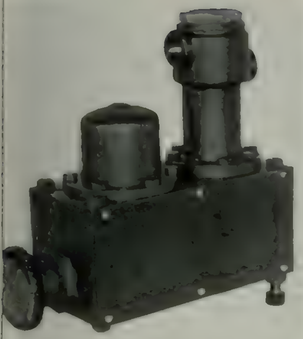
In cooperation with the Sun Shipbuilding and Dry Dock Company, the S.S. W. H. Berg has been equipped with a complete system of Hagan automatic combustion control. This system is similar in design to equipment recently installed on ten other tankers of various lines now in regular service.

The combustion control system is of the full metering type and maintains a definite relation between the fuel and air supply over the entire operating range. It is readily adjustable so that this ratio may be maintained for various sizes of burner tips. Adjustments are also provided for operating conditions which require changes in the fuel-air ratio.

The Master Sender (A) is sensitive to load demand as indicated by steam pressure changes, and establishes a pneumatic loading pressure

The air metering regulator.





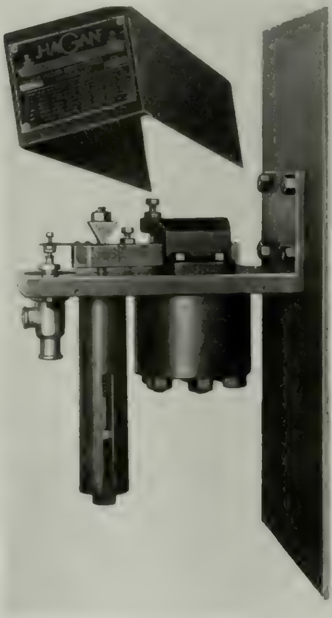
The adjustable ratio oil control valve.

i accordance with such variations i steam pressure. The master loadig pressure is transmitted to a Receiving Regulator (B) arranged for chanical operation of the outlet mpers of the forced draft fan. In tis manner the air flow is set up as quired to maintain the boiler load.

A three-way Automatic-to-Manual ansfer Valve (D) is located in the ster loading pressure line to pert changing the forced draft fan mpers from the automatic control the master sender to manual contol from a substitute loading presre generated by adjustment of the anual Control Valve (E). By this rangement the forced draft damp s, which are usually inaccessible om the firing floor, may be adjust at will by the mere turn of a ndwheel, rather than through a mplicated system of linkage.

While the draft loss across the iler setting is the commonly acpted measure of the air flow rough the unit, this differential at w ratings is too small to balance ainst a differential set up by the te at which oil is supplied to the rners. Therefore an Air Metering egulator (F) is connected to meare the differential across the boil setting and establish a pneumatic ading pressure proportional to the aft differential but amplified to magnitude more nearly that of the l flow differential. The range of is loading pressure is from zero to pounds, this being calibrated to rrespond with the full range of aft loss across the individual boil being controlled.

The loading pressure from the Air Metering Regulator is imposed upon the bellows of the corresponding Oil Control Valve (C), which maintains a balance between the loading pressure and the pressure of fuel oil at the burners. The burner tips may be considered as measuring orifices and the oil supply pressure thus serves as an accurate measure of the rate of fuel supply. The loading pressure from the Air Metering Regulator is proportional to draft loss, and this in turn varies as the square of the air flow (or directly as boiler rating), and the same relation exists between pressure and flow of oil through the burners. Thus the rate of oil supply is varied directly with the rate of air flow, the desired ratio of fuel and air being maintained automatically by the Oil Control Valve.



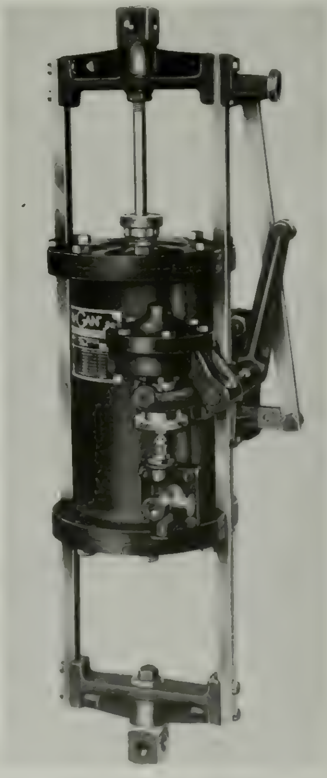
The master sender.

Adjustments of the fuel-air ratio may be made as desired by changing the position of the fulcrum in the Oil Control Valve. Such changes will not disturb any automatic functions of the control system. A calibrated indicating gage (H) at each Oil Control Valve serves as a guide to the operators by showing the extent and direction of any adjustments of the fulcrum position.

Bypass connections at each Oil Control Valve are provided for manual control of the firing rate. A handwheel adjustment of the pressure setting of the Master Sender is also located at the front of the Control Panel. These features contribute to the convenience of operating especially under port conditions with only auxiliaries in operation.

The design of each detail of equipment has been subjected to close scrutiny with the object always to assure long and reliable service. The amount of equipment has been kept at the minimum to insure convenience and ease of operation, and the system considered as a complete unit is designed to maintain accurate and reliable proportioning of air to fuel under all conditions of operation.

Paul F. Bovard and Clyde F. Williamson, of San Francisco, are sales representatives and service engineers for Hagan Combustion Control on the Pacific Coast.



The receiving regulator.

Matsonia the

Matson Navigation Company now operates finest, fastest, largest and most luxurious quartette of liners operating under the American flag

By A. J. Dickie

On the 14th of January a beautiful liner, her hull gleaming in new white, with blue trimmings, cleared for Honolulu from the Matson dock at San Francisco. On both sides of her bow and on her stern she carried in big blue block letters the famous name Matsonia.

This vessel is practically a new ship. As the Malolo, built ten years back by Cramps of Philadelphia, she has one of the staunchest steel hulls ever put together in an American shipyard. During the past two months she has: Had her de luxe passenger accommodations increased by 20 staterooms and 16 lanai verandahs; had her refrigerated cargo space increased by over 13,000 cubic feet; had her galleys and plumbing and propulsion machinery overhauled and adjusted and renewed where necessary; had her crew and some passenger accommodations rearranged and rebuilt to comply with all the latest rules; and been refinished and repainted within and without. All this at a cost of over half a million dollars. So she is practically a new ship, and now comes out with the new-old name of Matsonia.

The former Matsonia was one of the most popular ships on the Pacific. She was Captain Matson's pride, his first large venture into the passenger-cargo liner class. Built by Newport News in 1913, she had a length of 480 feet, a beam of 58.1 feet, and a depth of 36.5 feet. Her machinery was aft, and comprised a large four cylinder, triple expansion reciprocating steam engine driving a single screw. This engine, taking steam at 230 lbs. pressure from six Babcock & Wilcox water tube oil burning boilers and three Scotch marine type oil burning fire tube boilers, generated 8500 shaft horsepower at 80 r.p.m. and drove the vessel on her trials at 16½ knots. She had a capacity for 242 first class passengers and for 10,000 tons of cargo, and was a very popular and comfortable sea boat. Ten of her staterooms had private bathrooms adjoining, a rather new feature on the Pacific at the time of her advent.

The new Matsonia is 582 feet long, 83 feet beam, and 54 feet molded depth. She has a gross measurement of approximately 18,000 tons and a displacement of 22,000 tons on a draft of 28 feet. Her twin screw, triple expansion, single reduction gear turbines develop 25,000 shaft horsepower at normal speed and have a capacity for 15 to 20 per cent overload on spurts. At 25,000 shaft horsepower she will maintain a sea speed of 22 knots and can spurt 23 when necessary. She will accommodate 750 first class passengers. She has a dry cargo capacity for approximately 160,000 cubic feet and a refrigerated cargo capacity for over 30,000 cubic feet. On regular schedule she can transport 20,000 passengers a year from San Francisco to Honolulu and return. One hundred and twenty of her staterooms have private bathrooms and 50 others have private shower baths.

In the creation of this new Matsonia the principal alteration, and the most noticeable in its transforming effect, is the installation on B deck of 20 staterooms de luxe, 16 of which have private lanai verandahs and all of which have private baths. In order to make room for these groups of rooms the lifeboats were raised and mounted on Welin Maclachlan davits above A deck. A wonderful open air promenade is created by the extension of A deck over these new rooms to the ship's side port and starboard.

This change raises the apparent midship freeboard and gives the vessel even more of the passenger liner appearance. Between the two stacks on the bridge deck, the skylight above the main lounge or ball room

Magnificent

At left: The big face lifting job under the 100 ton sheer legs.

At right: The finished face with all make up properly applied.

ls been eliminated and in its place there has been installed a deck tennis court covering the entire space between the uptakes of the two stacks. Inside its fence this court is feet wide by 48 feet long. It is surfaced with Grass-Tex and will make a very popular addition to the sport facilities of the ship.

Entering a lanai suite bedroom one is impressed with the feeling of light, airy spaciousness that is very different from the feeling of the usual stateroom of the de luxe class. Such rooms usually give the observer an impression of unusual cleverness in designing furniture and equipment to fit in rather cramped spaces. These rooms give the impression that here each piece of furniture has ample room and can be moved about to suit the taste of the occupant. The usual hooks and gadgets are entirely missing from the walls, which are as neat and smooth in their broad paneled effect as those of any modern apartment bedroom ashore.

These walls are finished in a cool shade of aquamarine, restful to the eye and heightening the impression of spaciousness. By reference to the diagram reproduced herewith it will be observed that these rooms owe much of their charm to a very simple but very clever arrangement of the space. Between each pair of rooms three frame spaces are devoted to four wardrobe closets and two bathrooms, thus leaving the walls of each bedroom entirely free from projections into the room space.

The wall directly opposite the entrance door is pierced by a door and two large windows opening on the

Sweet lined and beautiful is her white, blue trimmed hull.

lanai verandah. On one side wall are three doors, one of which carries a full length mirror. Two of these doors give access to large clothes closets (not lockers) fitted with rods and hangars to take a large wardrobe. The other door opens on a delightful tiled bathroom equipped with all the external beauty and hidden quality of the finest Crane fixtures and fittings. Over the wash basin is fitted a special medicine cabinet with mirror door, supplied by Conant Bros. Company.

Decks in way of new rooms are covered with U. S. Royalite Rubber Tiling in attractive designs and coloring. This tiling was installed by the Freear Van Fleet Company of San Francisco.

Rooms are furnished with Simmons beds equipped with Beauty Rest mattresses, and Oriental bamboo motif furniture supplied by such firms as Sloane, Heywood-Wakefield, and the Art Rattan Company.

This bamboo motif is carried through to the lanai verandah. Here, too, are the Kearfott Full Vu windows, first of their type on a Pacific Ocean vessel. Three of these windows are fitted in each "lanai."

The name typifies the characteristics of this window. Its frame is fitted with glass throughout its entire height, which extends from a few inches above the floor deck level to the underside of the beams of the ceiling deck.

This glass is arranged in four horizontal panels in steel frame. Upper and lower panels are fixed. Two central panels are arranged to slide vertically, and are geared so that when the upper central panel is raised the lower central panel automatically slides down. This movement is manually controlled in the same manner as the hand operation of a house window ashore. The upper and lower slidable panels counterbalance each other, and therefore hold their adjustment in any position.

The net glass measurement for transmission of light by these windows is 30 inches in the width and 80 inches in the height. This results, of course, in an exceedingly well lighted verandah deck and in a seascape vision for the passengers exceeding anything heretofore attempted on shipboard.

The glass used is Pittsburgh 3/8 inch thick heat treated plate with a guaranteed strength four times that of ordinary plate.

All of these windows are equipped with individual Venetian blinds fitted at each end of the bottom bar with a roller traveling in a copper slot in the window frame.

Eleven of the lanais are fitted with two wall beds each. These beds fit snugly into recesses in the partition and are unnoticeable when closed. A special light fixture is fitted in each recess for use when the bed is occupied. This light is so connected that closing the bed automatically cuts out the light.

Particularly noteworthy is the beautiful joiner work in the paneling, doors, windows, and moldings in these suites. New rules for fire protection provide that all passenger spaces shall be of approved fireproof construction. To meet these rules the partitions between suites and the ceiling panels are of Johns Manville Marinite faced with sherardized steel. Sheets of this material prepared for the job by Hopeman Brothers of New York are divided into panels by special steel molding, which is applied in such fashion that all screw fastenings are concealed. This Hopeman patented construction produces a beautifully smooth effect in walls and ceilings.

Formed of asbestos fibre with an inorganic binder, Marinite is a solid, homogeneous sheet material that is light in weight, immune to vermin attack and harborage, and will not disintegrate under any degree of moisture. Superior to the conventional wood panels in sound-resistance, this product forms a highly satisfactory partition between cabins. Marinite possesses ample mechanical strength and has adequate screw-holding power for the attachment of fixtures.

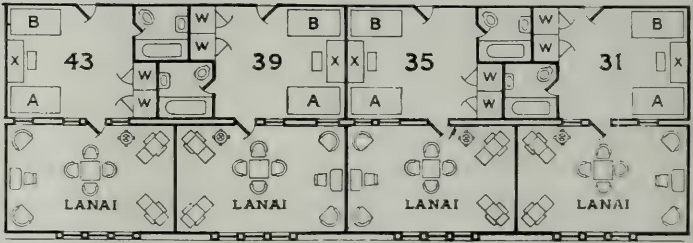
The ¾ inch thick panels of Marinite were faced with metal and painted. Metal-faced Marinite provides an exceptionally strong panel of minimum thickness which is capable of taking a fine paint finish equalling the best of painted wood panels.

Ceiling panels installed on the Matsonia are formed of painted Johns-Manville Marine Sheathing ⅜ of an inch thick. Manufactured in the same manner as Marinite, J-M Marine Sheathing is similar to it in appearance, but is denser and stronger. Like Marinite, it is incombustible and vermin-proof.

On one wall of the bedroom our attention is attracted to a polished, chromium plate, knurled edge disc with a small black button in its center. This disc is about the size of a silver dollar. When its black button is pressed in it makes a contact that rings a bell on the annunciator call-

S.S. Lurline,
running mate of
S. S. Matsonia
on the
San Francisco-
Los Angeles-Honolulu
route.

Ay, beautiful spaciousness characterizes the new lanai
te on Matsonia. Upper view shows lanai taken by
ght streaming in from the large windows at left.
w shows bedroom. Diagram at right shows arrange-
n of these rooms.



ing the room steward, and lights a small green lamp in the passageway above the door of the stateroom. This lamp remains lighted until the steward answering the call turns the chromium disc and releases the button from the contact. This is the Hospital Call Bell system of the Chicago Signal Company and, so far as our knowledge goes, this installation is the first on shipboard.

An especially noteworthy feature of the lanai suites on Matsonia is the control of air condition. All of the rooms are under the automatic air conditioning control of a Carrier Weathermaker installation that supplies them with filtered air of the exact temperature and degree of humidity necessary for maximum comfort.

This Weathermaker unit, together with all of the brine cooling coils, the heating coils, the fans, and the duct and louvre work for the 20 suites were supplied by the Carrier Corporation through Geo. E. Swett and Co. of San Francisco, its marine representative.

The special lighting fixtures for these rooms were made and installed by Thomas Day and Company of San Francisco.

To serve the passenger rooms on B Deck, and particularly the new lanai suites, where it may often be the custom to have breakfast or lunch on the verandah, a new pantry was installed. This room was equipped by the Dohrmann Hotel Supply Company with everything necessary to prepare light meals in cooperation with the main galley. A Cyclops automatic refrigerator, coffee urns, steam tables, toasters, broilers and other utensils are installed. This room shines with Monel metal on sink and drain-board, serving table tops, and shelf trim.

● Special Safety Equipment.

In line with the modernization of the vessel, the old type of mechanical davits were entirely removed from the ship and the latest type of Welin-Maclachlan Gravity Davits installed on the Navigating Bridge Deck, with their double 9-inch channel trackways extending down to embarkation or A Deck.

Sixteen sets of these davits were installed to handle the fourteen 60-person lifeboats and two 50-person motor lifeboats.

The lifeboats were equipped with Mills Releasing Gear to fit the new type of davits, otherwise no change was made in them. The closed type motor lifeboats were replaced with a modern open type, having a built-in combination motor and radio cabin located amidships. These boats are powered with a 20 horsepower Palmer motor and equipped with a radio sending and receiving set, folding antenna masts, mile ray searchlight, and all other safety features required by the Bureau of Marine Inspection and Navigation.

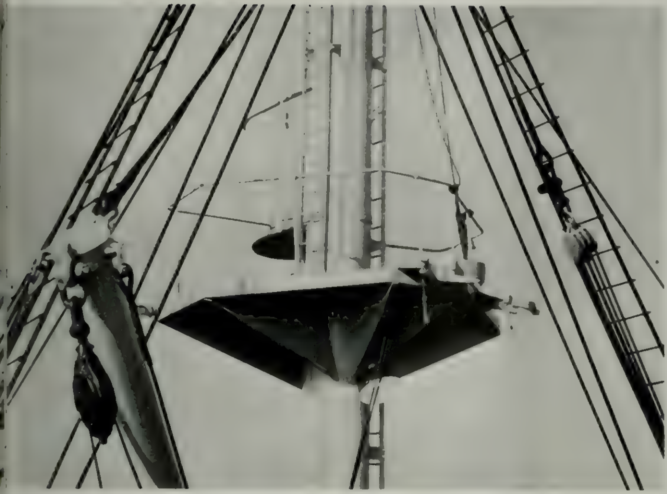
The davits are of the gravity type, in which the cradles are placed in their outboard position and the boat is lowered to the Embarkation Deck in one single operation, this being accomplished by merely releasing the brake on the winch. The boat automatically comes to a stop alongside the Embarkation Deck and, after the passengers are in the lifeboat, the brake is again released and the loaded boat is lowered to the water. The boats are recovered by eight 20 horsepower Diehl motors, double connected to fourteen 9-ton and two 11-ton Welin-Maclachlan Winches. These winches are located on the Navigating Bridge Deck, thereby leaving the Embarkation Deck free of all obstructions, which allows for easy access to the boats. In addition, and on account of its being open to the sunshine, this deck is a most desirable promenade and sports deck.

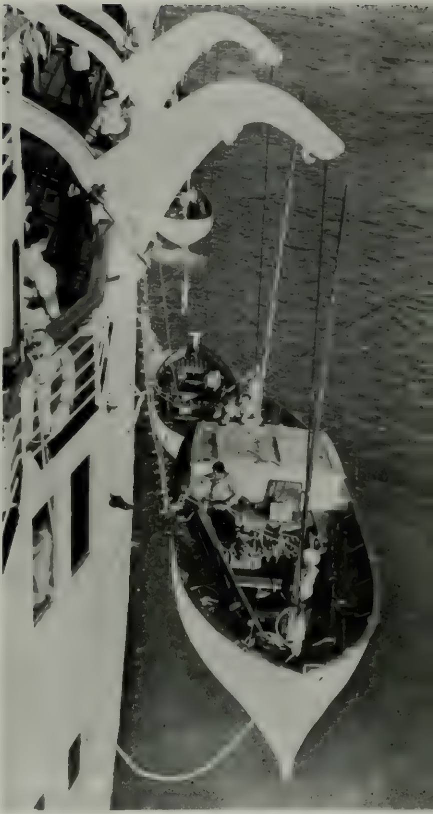
The entire modernization of this life-saving equipment was designed and built by the Welin Davit & Boat Corporation of Newark, New Jersey. Thomas A. Short of San Francisco, Pacific Coast representative for the Welin organization, personally supervised the installation.

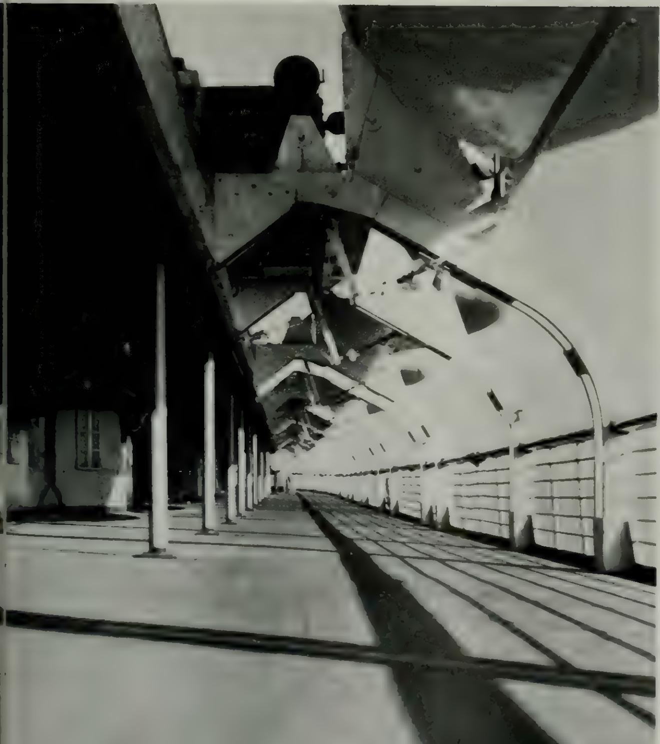
The Marine Safety Loudspeaker System, now required on all American passenger vessels, was installed by the Remler Co., Ltd., of San Francisco, and is the latest type approved by the Bureau of Marine Inspection and Navigation and Department of Commerce.

Twenty-nine loudspeakers distributed throughout the Matsonia permit the ship's officers to issue orders to the ship's personnel as well as directing passengers in emergencies and normal navigating conditions.

The Oceanic liner Monterey which, with her sister Mariposa, maintains schedule on the San Francisco - Los Angeles - Australia services under operating agency of the Matson Navigation Company.







Upper left: A railed work platform of welded steel insures safety of crew stowing cargo booms.

Upper right: The Welin Maclachlan gravity davits and new motor lifeboats, radio equipped, insure safer conditions in emergencies.

Left: The arched girders of the lifeboat davits form a pleasant cloistered promenade for strolling passengers who love fresh air. This is the finest promenade deck we have seen on a Pacific liner.

The main control panel is located in the bridge. Facilities are provided permitting the selection for communicating purposes of various groups of speakers or all speakers simultaneously. At various locations on the Boat and Embarkation Decks two way communication facilities are provided.

In addition to meeting the specified requirements of the Bureau of Marine Inspection and Navigation, the Matson Company have extended the system on the Matsonia and their other vessels to provide two way communication to the forecastle prow. They have also added microphone facilities in the extreme starboard and port ends of the bridge in addition to the main microphone on the bridge proper. These additional bridge microphones enable the officers to issue orders from these vantage points during docking as well as emergencies.

The amplifying equipment is located in a room aft of the Bridge, and supplies the great power needed to provide sufficient volume of sound through the loudspeakers to permit the communication to be readily heard regardless of surrounding conditions. This equipment is built with dual units and automatic switch-overs, assuring the highest degree of fool-proof operation.

On the foremast just under the crow's nest was erected a welded steel safety working platform for crew members working on standing rigging and on securing of cargo booms. This interesting development was suggested by the first officer of the ship.

The Cory A.D.T. fire alarm system was installed to cover all passenger spaces.

● Refrigerated Capacity Increased.

Not so spectacular, but of equal importance, were the improvements made in the arrangements of crew's quarters and refrigerated cargo spaces. The space formerly occupied by the large baggage room was cleared out and in large part given over to an enlargement of crew's quarters. The balance of this space was converted into a chilled reefer box of about 4800 cubic feet capacity.

Forward, out of general cargo space, a large baggage room was constructed, and another reefer box of 8500 cubic feet capacity. These new refrigerated cargo spaces are planned for forced cold air circulation, the circulating air being cooled by brine coils arranged along the bulkheads behind baffle board screens. The additional refrigerative capacity required to take care of this extra space and of the air conditioning requirements was supplied by installation of the following machinery and equipment supplied and installed by Geo. E. Swett and Company of San Francisco:

One Carrier 3 cylinder vertical CO_2 compressor, capacity 25 tons, driven by a 12-inch by 12-inch Troy Engberg steam engine.

One Carrier condenser, shell and tube type.

Three Carrier Evaporators of the "D" type.

Four Ilg Blowers for circulating air in new cold storage boxes.

Brine Coils for new cold storage boxes.

Two 10 H.P. motor driven Warren Centrifugal Brine Pumps, capacity each 300 G.P.M., 70 ft. head, with variable speed control (Westinghouse motors.)

Miscellaneous Ashcroft recording instruments and thermometers.

All new brine lines, connections and cork pipe covering and lagging.

Mundet Cork Corporation supplied and installed the insulation on the Carrier equipment.

These cold storage boxes are insulated with corkboard supplied by the Freear Van Fleet Co., and are equipped with patent refrigerator box doors supplied by the Henshaw Refrigeration and Fixture Company. Pipe bends for the brine circulating coils were supplied by the U. S. Pipe Bending Company of San Francisco.

An interesting item of improvement is the installation, in way of the side ports for hand trucks, of

Mariposa, the fourth white beauty of the Matson-Oceanic liner quartette.

ast brass carborundum filled non-skid tread, across the passageway inside the port. These treads were specially cast for the job by the San Francisco Brass Company.

Propulsive Machinery.

During the reconditioning work on the Matsonia her turbines and gears and all machinery in the engine room were opened up, inspected, overhauled and adjusted. Very few renewals were necessary. On the turbines and gears only minor adjustments of bearings were found necessary. The gears were built specially for this vessel by the De Laval Steam Turbine Company, and the turbines were Parsons type, built by the shipbuilders.

Johns-Manville supplied much insulation material for the reconditioning of the machinery spaces, including 85 per cent Magnesia Insulation on boiler space casings and JM Pipe Covering.

These De Laval gears were in practically the same condition as when they were installed. Considering the schedule maintained by this vessel (as the Malolo), this gear condition is a remarkable achievement and speaks volumes for De Laval skill and experience in the design and manufacture of mechanical speed reducing gears, and for the maintenance organization of the Matson Navigation Company.

The Malolo has covered over a million sea miles in her ten years of operation, which means, of course, all sorts of weather and many occasions of terrific shock stresses on gear teeth. But the teeth are all there, all sound and all ready for another million mile battle with the elements.

A new feed water heater was installed. This heater, designed by the Matson staff and built by Bethlehem Shipbuilding Corporation, Ltd., is figured to improve the economy of the power plant through a more efficient use of the steam bled for feed heating purposes, thereby producing higher temperature feed water.

In connection with the rearrangement and alterations of outside promenade decks, twenty-five thousand board feet of new 3-inch teak decking was laid, caulked, seams payed, and sanded to a smooth dance floor surface. White Brothers of San Francisco supplied some of this teak.

On the enclosed promenades 18 additional windows were installed. These are the noted Kearfott K-500 type of crank operated vertical sliding windows. They are fitted with a weathering frame that makes them absolutely water tight. Twelve of these windows are glazed with 3/8 inch Pittsburgh heat treated plate, and the other six with ½ inch of the same glass. This glass is of great strength, is highly elastic, and absolutely non-shatterable. When it breaks it crumbles to practically a powder.

Considerable equipment was added to the galley, including new electric Toastmasters, coffee urns, a stainless steel tilting kettle, a large steel vegetable steamer, and many other items.

The ventilation system was thoroughly overhauled to eliminate any bugs and to take care of the changes in accommodations. An interesting addition was the installation of Dustop Filters on the inlets to blowers supplying the after deck ventilation systems. These are coarse wire mesh frames filled with spun glass and are a product of the Owens-Illinois Glass Company, supplied through the Warren and Bailey Company of San Francisco.

In way of the new tennis court, under which is the circular sunburst forming the center of the ceiling of the main lounge, exhaust blowers were installed to draw off the dead warm air from this ceiling recess, which was formerly ventilated by a skylight.

All of the lifeboats were provided with a new type Jacob's ladder. This ladder has aluminum safety treads joined by steel chains in such fashion that it lays compactly and pays out neatly with practically no danger of kinking. This ladder is of ample strength but very light in weight and easily handled by one man. It is distributed in San Francisco by the C. J. Hendry Company.

All of this work, involving the expenditure of well over half a million dollars, and spread over many firms, was supervised by the Matson technical staff with such success that it was all finished ahead of schedule without spending anything for overtime.

This fact attests not only the ability of the Matson organization, but also the remarkable cooperation that was obtained from such firms as Warren & Wetmore on interior decoration and arrangement; Hopeman Brothers on joiner work; and the Bethlehem Shipbuilding Company on structural work and installation.

Duco paints were much used on topsides and interiors. On completion of the work at the shipyard Matsonia went to Hunters Point Dry Dock, where her bottom was thoroughly cleaned and received new coats of International Anti-Corrosive and Anti-Fouling paints.

And so the Matsonia takes her place alongside the Lurline as a very worthy unit in the Matson express passenger service between San Francisco - Los Angeles and Honolulu.

Radio Progress in 1937

A Review of the Accomplishments on the Ether Lanes

By David Saranoff

President, Radio Corporation of America

David Saranoff

The Radio Corporation of America occupies a position of leadership in each of the fields of radio in which it is actively engaged,—communications, broadcasting and manufacturing. During 1937 the company enjoyed an increased volume of business in each of these fields, the proportions of volume following the pattern of the general business cycle for the year. While it is too early at present to predict future trends with any exactness, the RCA organization is geared to meet the public demand for its products and services.

In the field of communications, the volume of messages transmitted between the United States and other countries, and between shore stations and ships at sea, showed a material increase over any previous year. The overseas transmission of broadcast programs and of photographic reproductions likewise increased in volume. Prominent among the year's accomplishments were the automatic SOS radio alarm for the greater safety of ships at sea, and new and improved radio direction-finders for aviation and marine use.

In the field of broadcasting, sales of network time by the National Broadcasting Company were the largest in the company's history. The number of NBC affiliated stations was increased to a total of 143, thereby making NBC programs available to almost every radio home in the United States. During the year the NBC put into operation a comprehensive service of radio programs transmitted by directional shortwave to listeners in Europe and Latin America.

In the field of manufacturing, the sale of RCA Victor products enjoyed a substantial increase over the preceding year. The development of electric tuning met with widespread public acceptance, and brought about pronounced changes in set design. Marked technical advances were made in recording and reproduction of sound on motion picture film, and in theatre sound equipment. The application of radio discoveries to the field of recorded music, including phonograph instruments, phonograph-radio combinations and records, has continued to produce a gratifying increase in the public demand for these products. Public appreciation of good music has been greatly stimulated by better programs on the air and the improved phonograph and record technique.

The RCA television system is steadily progressing toward the ultimate goal of a public television service. Outstanding television advances during the year include the development of more sensitive Iconoscopes, and of larger Kinescopes, presenting black-and-white instead of tinted pictures; the projection of television pictures onto a 3′ x 4′ screen; the successful transition from 343 to 441-line scanning; and the development of a mobile truck-unit for outside program pickups. RCA Kinescopes and other special articles of equipment have been made available for amateur television experimentation.

The present-day stature of radio was emphasized by the caliber of men, eminent in other fields, who joined RCA ranks during the year. Dr. James Rowland Angell, lately president of Yale University, became Educational Counselor of the National Broadcasting Company. Edward F. McGrady, former Assistant Secretary of Labor, joined the Radio Corporation of America as its Director of Labor Relations, and his ability and experience help to maintain the harmonious relations existing between the company and its employees. Maestro Arturo Toscanini, the world's most famous orchestra conductor, commenced on December 25 a series of ten concerts with the outstanding new NBC Symphony Orchestra for the benefit of radio listeners. Radio's service to the public is enhanced in value and distinction by the services of these gentlemen; the truth hardly needs to be reaffirmed that the greatness of any industry rests not on machines but on men.

In world-wide communication, in broadcasting, and in the creation of instruments essential not alone for its own use but for many branches of science and industry as well, the year-end finds radio everywhere more highly regarded than ever before as a dependable public servant.

ecks That Cover The Ships That Cover The World

To the operators of ships, decks e a matter of great importance.

Two purposes may be economically rved in modern ship construction a deck covering material. Each these purposes functions to effect different saving.

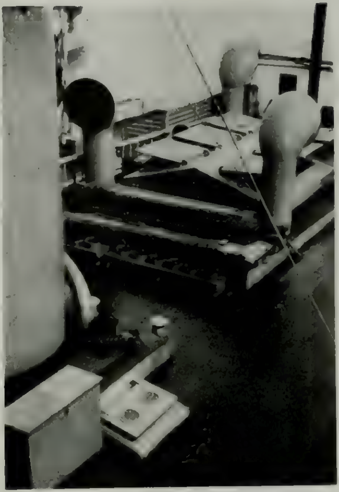
The principal reason for covering deck is to preserve it from the ef-cts of weather exposure, subse-ently reducing maintenance costs. e secondary reason may be classi-ed as safety. Frequently this sec-dary reason becomes the primary ason. This depends upon local cir-mstances. Each of the two reasons ay be subdivided into two parts. t us consider them individually.

Causes of Leaking Decks.

First, we shall consider the case weather-exposed wooden decks. ese decks have wood planking laid er steel beams with tie plates fit-d at the margins. Practically al-ays this wood deck covers such aces as living accommodations, orerooms, or chart rooms. This cking must be maintained water-ht. To effect this water-tightness, e seams between planks are caulk- with cotton or oakum, then paid sealed with marine glue or pitch. time the caulked seams open ghtly, either through shrinkage in e width of the planking because of cessive dryness, or deterioration the caulking material, or because excessive strains set up when the ip is laboring in heavy, boiling as.

This results in a leaky deck. It s a disastrous effect on interior odwork, fittings, electric conduits d personal belongings.

The beams and tie plates under the ck may become badly corroded by oisture between them and the wood anks. The remedy for this is in lo-ting and recaulking the leaky ams. Often this runs into an ex-nsive complete recaulking of the deck.



Case weather decking on the house top of a steamer makes a continuous sheet of wear resistant, non skid, waterproof surface.

We have steel decks over quarters. This type of deck, of course, requires constant care and attention to preserve its entire surface. A continuous operation of sealing and scraping off rust and loose paint and repainting exists. There is also the loosening of rivets and opening of seams due to the strains set up by pitching and rolling in heavy seas. In spite of all the usual care given steel decks, deterioration and susceptibility to leaks is constantly at work. The general method of maintenance is very costly.

● Effective Preservation of Decks

For many years Leland S. Case, of the L. S. Case Company at San Francisco, studied and experimented with this problem—both from the preservative and safety angles.

His first efforts resulted in a weather-proof non-slip paint used over regular Case Weather Decking. While it gave good results, Case was not entirely satisfied. Greater durability and more effective non-skid qualities were desired. Case's standards are exacting. So, after lengthy experimentation, he developed a formula for a weather-resisting, fireproof sheet with a wear-resisting surface which readily and economically could be applied to the surface of wood and steel decks.

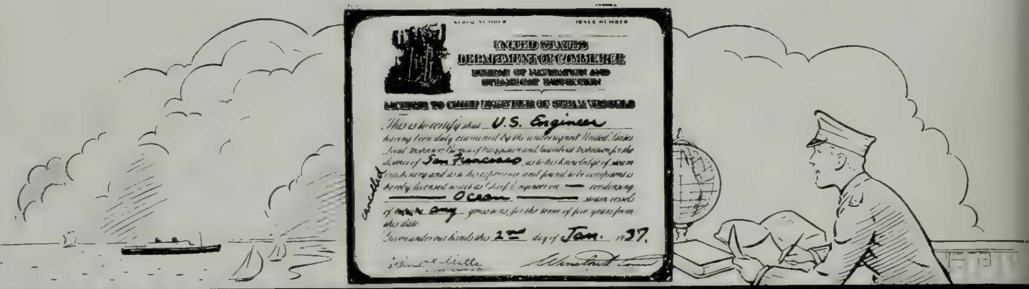
The manufacture of this material was placed in the hands of the highly competent The Pabco-Paraffine Companies, Inc., manufacturers of floor coverings, paints, marine finishes, roofings and building materials, and after many experiments and tests Pabco produces what is now available as Case Weather Decking.

● Safety Features

As mentioned, one of Case's objectives was to produce a deck covering that would embody a non-slip quality

(Page 57, Please)

Case weather decking on the house top of a motorship.


UNITED STATES
DEPARTMENT OF COMMERCE
BUREAU OF NAVIGATION AND
STEAMBOAT INSPECTION
LICENSE TO CHIEF ENGINEER OF STEAM VESSELS
U.S. Engineer
San Francisco
Ocean
any
2nd
Jan.
37.
Cancelled

Your Problems Answered

by "The Chief"

The word "Cancelled" was inscribed on face of the above license at the direction of the Bureau of Marine Inspection and Navigation. As used here it means "Specimen Copy."

Special Letter to Junior Engineers

I want to make a very special appeal to the young men in our profession, particularly to those who are anxious to advance their self-improvement program and to get ahead.

In my many contacts with marine engineers I have found one outstanding quality or characteristic possessed by every one of the really good engineers, which is hardly ever a part of the inferior man's make-up. I refer to the ability to make sketches or free-hand drawings.

I remember an English teacher of my early days who, to my youthful excuse, "I know it, but I can't explain it," replied sharply, "If you cannot tell it, you do not know it." I would like to add to this the axiom, "If you cannot sketch it you do not understand it."

I can say definitely that if you can sketch it you do understand it. Furthermore, if you really want to understand some mechanical thing, try to sketch it and you will soon learn more about it. Therefore I strongly recommend that you start at once to develop your sketching. Looking towards helping you along this line I offer the following general comments:

Mechanical drawing is in no sense an attempt to show an object as it really appears. It is rather a special language used by engineers to explain an object or system to others who understand this language. It also shows details inside which would not show in a photograph, and gives dimensions so that it can be laid out and fabricated.

Mechanical drawing is orthographic projection. Sketching, in the sense we use it, is mechanical drawing done free-hand, without aid of special instruments. A good medium pencil, an eraser, plain white paper, and perhaps a small straight edge and pocket compass are useful. No attempt should be made to use the straight edge and compass until the principles of sketching are well understood.

Practice making straight lines. Do them over and over again until a group of lines close together show some signs of regularity. Note and correct any fault which seems to occur often. Then practice on circles, large and small.

Next study the meaning of orthograhic projection and the three main views and several auxiliary views. You will have to develop your imagination for this, as a great many imaginary ideas are used to express the thought needed. Get a cardboard box and place in it any small, simple object, such as a bolt or pack of cigarettes and close the cover. As the box sits on the table in front of you, mark in pencil on the largest vertical side the name "front view." Then on the side adjoining this front, on the right hand, mark the name "side view." The top or cover should be marked "top view." Now on the front view side draw the outline of the object just as your imagination tells you it should appear. Use a curved or straight line to represent the boundary or border of any surface you see from the front; also the intersection of two or more surfaces. Then turn the box so that the right-hand side faces you, and sketch in the side view. Look down on the box and sketch the top view. Ordinarily this will complete all the views necessary to show all the details. Frequently, with objects like a bolt or piston, two views are all that are necessary, as the third view will be the same as one of the others.

These three views can be placed on a single piece of paper with the top view over, and the side view to the right of, the front view. To show the surfaces or openings inside the object, which do not show in a photograph, a dotted line may be used, indicating that the border represented is in back of or behind the main body surface. Another popular method is to show a section. This type of view imagines that the object is hack-sawed through a center plane and a part lifted off, exposing to view the inside details. The parts that, in imagination, are cut by the saw are then cross hatched by shadn with many parallel sloping lines lo together.

Lightly drawn lines passing through the center of the object in each view are a great help in locating the several parts. These center lines should be sketched in at the very start.

Study the advertisements in this magazine and note the drawings and pictures. Practice sketching some of them. Then sketch a valve, piston, boiler fitting or other part you are interested in. You will find difficulty in putting in some of the parts. This shows that you are not familiar with it, and you should examine the part itself or other drawings of it to clarify that detail.

hen study arrangements such as boiler or engine room layouts and sketch one. Learn to indicate dimensions on your sketches. You will find that this practice greatly increases your knowledge of the details of the machinery we are working with.

Speed Reducing Gears for Propulsion

QUESTION

What are some of the general requirements of marine propulsion speed reducing gears?

ANSWER

peed reducing gears are used to accommodate the very high rotative speed of the modern efficient steam turbine to the necessarily low rotative speed of the propeller. As discussed in our last article, the nature of the propeller is such that under best conditions the r.p.m. will nearly always be about eight to ten times the ship's speed in knots. We would like to spin our turbines up to 6000, or even 7500, r.p.m. if we could without difficulties elsewhere.

The reduction gear must give us the required speed ratio and at the same time must be extremely reliable, light weight, quiet and efficient, and carry the heavy overloads, particularly the shock loads, both ahead and astern. The gears couple together the high inertia of the propeller and the high speed rotor of the turbine so that in a heavy sea very high stresses are set up in the gear. The accompanying sketch, traced from a curve made by a recording torsion meter, shows the torque rapidly changing from zero to almost double load in seven-second periods. This was taken on a merchant ship, loaded, requiring about 2000 H.P. at 78

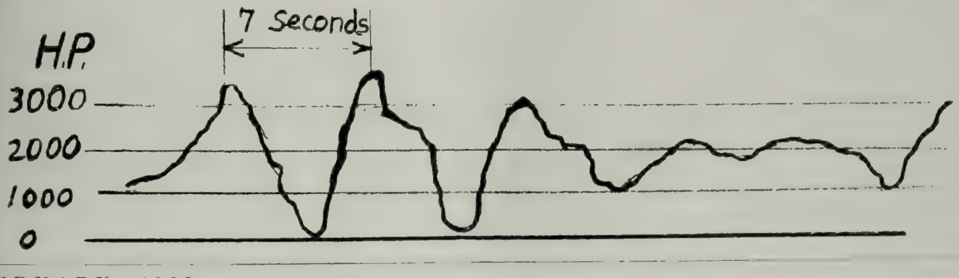
(Page 55, please)

Engineers' Licenses

The following list shows the licenses granted during the month of December to engineer officers of the merchant marine at Pacific Coast offices of the Bureau of Marine Inspection and Navigation. For key to abbreviations see footnote.

Name and Grade	Class	Condition
SAN PEDRO		
Charles L. Eversole, 3rd Asst. Eng.	OSS, any GT	O
Virgil E. Slaten, 2nd Asst. Eng.	OSS, any GT	RG
John E. D. Mead, 2nd Asst. Eng.	OSS, any GT	RG
Richard J. Mulle, 2nd Asst. Eng.	OSS, any GT	RG
William R. Kerr, Jr., 2nd Asst. Eng.	OMS, any GT	O
SEATTLE		
Curt H. Siegert, Chief Eng.	OMS, any GT	O
William H. Davison, Chief Eng.	OMS, any GT	O
Clyde A. Holeman, Chief Eng.	OMS, any GT	O
Leslie O. Flanders, 2nd Asst. Eng.	OSS, any GT	RG
Russell J. King, 2nd Asst. Eng.	OSS, any GT	RG
PORTLAND		
Harold O. York, 2nd Asst. Eng.	OSS, any GT	O
George A. Frison, 1st Asst. Eng.	OSS, any GT	RG
William T. Partridge, 3rd Asst. Eng.	OSS, any GT	O
SAN FRANCISCO		
Francis J. Cabral, Chief Eng.	OSS, any GT	RG
Patrick F. Kane, Chief Eng.	OSS, any GT	RG
John P. Hiersch, Chief Eng.	OSS, any GT	O
Harry E. Mead, 1st Asst. Eng.	OSS, any GT	RG
Eugene P. Larsarte-May, 1st Asst. Eng.	OSS, any GT	RG
Robert D. Nelson, 2nd Asst. Eng.	OSS, any GT	RG
John H. Throckmorton, 2nd Asst. Eng.	OSS, any GT	O
John F. Yarger, 2nd Asst. Eng.	OSS, any GT	O
Pablo Couso, 2nd Asst. Eng.	OSS, any GT	O
Frank Mariette, 2nd Asst. Eng.	OSS, any GT	RG
Robert B. Fox, 2nd Asst. Eng.	OSS, any GT	RG
Andrew V. Erickson, 2nd Asst. Eng.	OSS, any GT	O
James S. Fitts, 2nd Asst. Eng.	OSS, any GT	RG
James E. Burton, 3rd Asst. Eng.	OSS, any GT	O
Harry R. Slayton, 3rd Asst. Eng.	OSS, any GT	O
Leon C. Fields, 3rd Asst Eng.	OSS, any GT	O
Lincoln P. Crymes, Chief Eng.	OMS, any GT	O
Edward W. Walters, Chief Eng.	OMS, any GT	RG
David P. Drago, Chief Eng.	OMS, any GT	O
Harry S. Johnson, 3rd Asst. Eng.	OMS, any GT	O

Abbreviations: GT is gross tonnage; RG is raised grade; O is original license; OSS is ocean steamer; OMS is ocean motorship.



For American Deck Officers

On Sticking versus Jumping Around

"Hello, Bill, it's sure a long time since I have seen you!"

"Yes, it must be at least six or seven years."

"Where are you located now, Bill?"

"Oh, I am with a company here—have been with them five years now and am first mate on one of their ships. What are you doing, John?"

"Me? I am second mate on a tub across the Bay. You know me; I can't stay one place long. I have been first, second, and third mate on all kinds of ships, but I don't want to feel that I have to put in all my days with one outfit.

"What do you ever hear of—you know who I mean, Bill—the skipper we were with on that ship in Alaska?"

"You bet I do, John. I have never seen him since, but will never forget him. He was the whitest man I have ever met. Discipline—there never was another vessel with more; in fact, that was the strictest-run ship I was ever on and one of the happiest for all concerned, because that skipper was fair and square with everyone. He never did anything himself that he did not want everyone else to do, and would not think of making anyone do a job he would not be able to do, perhaps better than we could. You remember, John, how he took the trouble to find out how your mother was after you laid off one trip while she was in the hospital? And just the same, the next day when you got out of line on board ship he would climb all over you and tell you in no uncertain terms what he expected, and not only that—what you were going to do if you sailed there."

"Yes, I remember well, Bill, and not so much the going over he gave me, but if you did something well the next hour he was just as ready to give you a pat on the back and tell you that it was a good job. Yes, sir, that man had not only the respect of the officers and men, but everyone he came in contact with. I sure wish there were more like him."

"Bill, what do you figure on doing? What's the idea of staying so long in one company?"

"There is only one answer to that John, and that is, that I am with a good company. They look after me and I am going to give them all I have in return. Listen, when any company treats you as if you were a man, that the promotions as far as possible are on a fair basis, and you are practically assured year around employment—and not only all those things, but reasonable rate insurance may be had through their efforts, and in addition to these benefits, I am a member of the pension plan

Deck Officers' Licenses

The following list shows the licenses granted during the month of December to deck officers of the merchant marine at Pacific Coast offices of the Bureau of Marine Inspection and Navigation. For key to abbreviations see footnote.

Name and Grade	Class	Condition
SAN PEDRO		
Karl P. Parker, Master	OSS, any GT	RG
Edward C. Dumouchelle, Master	OSS, any GT	RG
Lawrence W. Tebeau, 2nd Mate	OSS, any GT	O
Philo Wood, 2nd Mate	OSS, any GT	RG
SEATTLE		
Walter Pedersen, Master & Pilot	OSS, any GT	RG
Albert McCabe, 2nd Mate	OSS, any GT	RG
Edwin W. Nystrom, 2nd Mate	OSS, any GT	RG
James L. Acord, 3rd Mate	OSS, any GT	RG
PORTLAND		
Finn Hansen, 3rd Mate	OSS, any GT	O
SAN FRANCISCO		
Thomas Olsen, Master	OSS, any GT	RG
Volmer H. S. G. Holm, Master	OSS, any GT	RG
Knut B. Strand, Master	OSS, any GT	RG
Karl E. Rosenblad, Chief Mate	OSS, any GT	RG
Walter F. Hansen, Jr., Chief Mate	OSS, any GT	RG
Edward K. Lofgren, Chief Mate	OSS, any GT	RG
Hereford Hicker, 2nd Mate	OSS, any GT	RG
Alfred N. Andersen, 2nd Mate	OSS, any GT	O
A. Walter M. Mowinckel, 2nd Mate	OSS, any GT	O
Robert E. Bekeart, 3rd Mate	OSS, any GT	O
Dayre B. Freeman, 3rd Mate	OSS, any GT	O

Abbreviations: GT is gross tonnage; RG is raised grade; O is original license; OSS is ocean steamer; OMS is ocean motorship.

Change of Masters

Steamer Mojave: H. J. Schroeder; Vice, J. M. Tosh.
Steamer Montebello: Otto Weidman; Vice, M. Andreassen.
Steamer Tulsagas: C. A. Moerman; Vice, R. W. Kelly.
Steamer Coloradan: Lester C. Hansen; Vice, G. Grundy.
Steamer Admiral Halstead: F. J. Weiler; Vice, E. E. Johnson.
Steamer Kewanee: F. W. Rosvally; Vice, O. E. Lilly.
Steamer Forbes Hauptman: S. Brown; Vice, O. Bevilagua.
Steamer Phyllis Soto: H. B. Olsen; Vice, E. A. Kaufhold.
Steamer Maunalei: J. I. Hamma; Vice, M. Gordenov.
Steamer Warwick: Carl C. Nielsen; Vice, Thomas J. Weiler.
Steamer Admiral Halstead: E. E. Johnson; Vice, Thomas J. Weiler.
Steamer Point San Pedro: Louis Prendle; Vice, N. A. Nielsen.
Steamer Manulani: C. H. Morgan; Vice, C. L. Brocas.
Steamer Mauna Ala: W. R. O'Brien; Vice, S. King.
Steamer Kewanee: G. A. Moerman; Vice, R. W. Kelly.
Steamer Tulsagas: R. W. Kelly; Vice, G. A. Moerman.
Steamer Warwick: H. Dahlof; Vice, C. C. Nielsen.
Steamer Point Vincente: G. Hagberg; Vice, A. C. Nielsen.
Steamer Honomu: J. H. Trask; Vice, C. W. Saunders, Jr.
Steamer Kewanee: O. E. Lilly; Vice, G. A. Moerman.
Steamer F. W. Hillman: S. C. Sullivan; Vice, J. S. Christenson.
Steamer Texan: F. J. Butler; Vice, F. C. Seibert.
Steamer Charles L. Wheeler, Jr.: Fred E. Conrad; Vice, D. Danskannon.
Steamer S. C. T. Dodd: L. J. Sullivan; Vice, A. K. Koskin.
Steamer Coloradan: G. Grundy; Vice, L. C. Hansen.
Steamer West Shipper: E. Mesak; Vice, Oscar Salo.
Steamer Isthmian: F. C. Seibert; Vice, E. E. Johnson.
Steamer Maunawili: M. J. Bulger; Vice, H. R. Gillespie.
Steamer Jane Christenson: C. Olsen; Vice, Edward Anderson.
Steamer F. H. Hillman: J. S. Christenson; Vice, S. C. Sullivan.

ereby at a retirement age I don't
e to worry about going to a poor-
use, then you ask me why I stick!

Now, John, you give me the rea-
s you have for jumping around
m one ship to another."

Bill, I have never looked at it in
same light as you have put it,
rely that when I got tired of one
p I quit, and sometimes before I
und another job I was broke and
borrowed money to live on. Be-
ve me, sometimes it has been hard
take, but when you get ahead a
le you forget the part that was
agreeable. We certainly are not
made alike, and your kind is bet-
off in the end, there is no doubt
that. Bill, I sure hope that you
ve all the success in the world, and
t when your turn comes and
u're skipper of a ship, you'll re-
mber our old captain and his feel-
toward everyone that worked for
n; that seems to be the answer—
r and square about everything—
d at the same time maintain dig-
y and discipline. Well, I guess as far as I am concerned I'll still be taking a job on this or that ship just as they come along twenty years from now."

"Good luck, Bill, and good bye."

"So long, John; I hope you change your mind and settle down with some good outfit."

Problems Answered by the Chief

(Continued from Page 53)

r.p.m. Speed varied two r.p.m. above and below this value. The sea was only moderately rough. This shows the decidedly increased torsion stress imposed on shafting and gears due to the inertia effect of the high speed turbine rotor. This will be discussed further when we come to consider the combination of turbine and reciprocating engines on the same shaft.

QUESTION

What determines whether single or double reduction gears shall be used?

ANSWER

The reference to single or double reduction means one or two pair of mating gears, respectively, are used. The speed is reduced, respectively, in one or two steps. Single reduction gears frequently have two or more pinions mating on one gear, or two gears may mate on one pinion in the first reduction of a set.

With respect to single reduction units, double reduction gears are heavier, more expensive, less efficient, occupy more room, and are less simple in construction. However, the ratio of speed reduction for any pair of mating gears is definitely limited. Twelve to 1, or certainly 16 to 1, is the top limit of reduction ratio. With the latter ratio, a 10 inch diameter pinion would mate with a 160 inch gear, a cumbersome arrangement. And, furthermore, with this ratio a 2000 r.p.m. turbine would drive the shaft at 125 r.p.m. To run the shaft slower and the turbine faster, as is desirable, we must go to the double reduction unit. If the turbine designer were allowed to select the turbine speed to give best economy in steam, weight, cost and general desirability, he would select speeds about as follows:

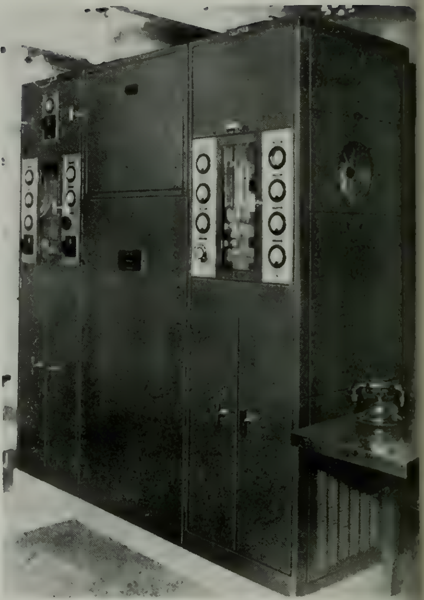
power Horse-	Speed r.p.m.	Horse-power	Speed r.p.m.
1000	10000	7000	5500
2000	8500	10000	5000
3000	7500	12000	4500
4000	6500	15000	4000
5000	6000	20000	3000

These speeds would apply to the high pressure turbine at modern steam pressures. Lower pressures and the low pressure unit of a compound turbine would require from 1000 to 2000 r.p.m. less than the above values.

Single reduction requires a compromise both in the propeller and the turbine. Hence it is safe to say that, except for very high speed and powerful vessels, such as military ships, double reduction gears will be generally used.

Our next article will discuss some of the design problems involved in reduction gear selection.

Ship to Shore Radio Telephone Service Established



Radio Telephone Equipment on S.S. Washington

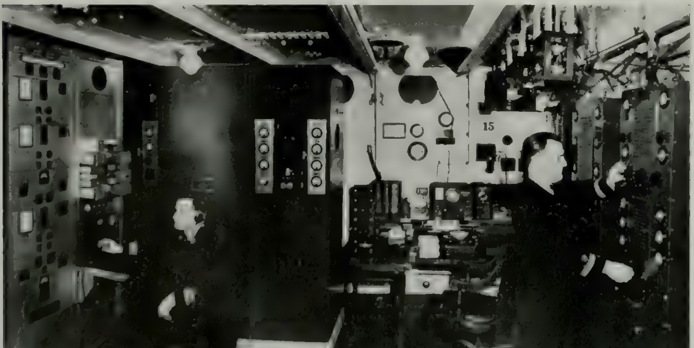
Radiotelephone service between United States liners Manhattan and Washington and all parts of the world was opened at midnight on December 14 when the Washington sailed from New York. Mackay Radio and Telegraph Company furnished and installed the radiotelephone equipment and operates the service aboard the ships. The Manhattan and Washington, twin prides of the American merchant marine, are the only American liners having radiotelephone service. Adding this service to the most modern and complete radiotelegraph installations on an American liner, which Mackay Radio installed at the time the ships were commissioned, the Manhattan and the Washington continue to maintain their leadership in providing the last word in ship communication. They are among the world's greatest communications centers afloat, handling daily a business comparable to that of a sizable city.

The radiotelephone apparatus, manufactured for Mackay Radio by the Western Electric Company, is the latest development in mobile radiotelephone equipment. Although extremely compact it is powerful, and provides excellent transmission with stations on both sides of the Atlantic throughout voyages.

The service is operated with the stations of the American Telephone and Telegraph Company in New Jersey and with the stations of the British Post Office in England with the connections at New York and at London for service to all parts of the world.

One of the interesting features of this new ship-to-shore equipment is the privacy device which assures the secrecy of conversations. By reversing the frequencies it renders the voice meaningless in transit. The receiving stations, of course, convert the voice to normal so that the conversationalists are unaware that anything peculiar happened to their spoken words.

In commenting on these installations Admiral Luke McNamee, president of Mackay Radio, stated that he considers this new radiotelephone equipment another outstanding advancement in ship-to-shore communication. "I am happy that my company is playing its part," he said, "in helping to build up the technical ex-



The radio room of S.S. Washington (the Manhattan is identical). The new radiotelephone equipment is at the left, the radiotelegraph long wave, short, intermediate and emergency transmitters at the right. These American ship radio centers do a daily business comparable to that of a sizable city.

ence of the American merchant ine. Naturally, reliable com- ication is one of the most vital essities in the operation of ships y."

. J. McCarthy, vice-president of United States Lines, opened the ice in a conversation with Cap- Giles C. Stedman of the Wash- on. McCarthy had talked with the ship several days previously, while final adjustments to the radiotelephone equipment were being made, regarding an emergency which had taken the Washington off its course. An injured seaman from another vessel who required immediate medical attention was picked up and treated by the Washington's physician.

Large Aviation Radio Order

he order for 42 aviational com- ation radiotelegraph and radio ge beacon signal transmitters at stations of the Bureau of Air nmerce of the Department of Com- ce is in manufacture at the plant Federal Telegraph Company, New- . N.J., an affiliate of Mackay lio and Telegraph Company. This erial, according to Admiral Luke Namee, president of Federal Tele- ph Company and Mackay Radio Telegraph Company, is to re- ce and modernize radio-telephone beacon equipment along princi- air routes. The new stations will orporate the numerous recent ad cements which have resulted m intensive development work on io aids to air navigation.

t is expected, Admiral McNamee s, that the first series of beacons l be installed by late May, and t all of the 36 stations will be in vice by March of next year. The tract with Federal Telegraph re- sents approximately $500,000 in ipment and in installation ser- e.

The outstanding feature of the w stations, regarded as one of the st important advances of the past ade in aids to air navigation, is t they provide for transmitting the ather reports and other important ormation by voice without inter- ting the radio beacon signal ch the pilot follows con- ntly to determine his position and exact course. It is simultaneous liotelephone and radiotelegraph nsmitting to a single receiving . It is accomplished by incorporat- an auxiliary transmitter which erates at a frequency slightly gher for the radio beacon signals than the carrier frequency of the voice broadcast transmitter. By means of a special device on the air plane radio receiver the pilot may listen to the beacon signal while the co-pilot is receiving broadcast information. With most of the equipment now in use it is necessary for the sender of the radio beacon signals to interrupt those signals while broadcasting other information. During the period when the beacon signal is interrupted the plane may have traveled five, ten or even more miles without its directional radio beam, and in bad flying weather, this is far enough to be dangerous.

The equipment which is being produced, according to Bureau of Air Commerce specifications, includes: Transmitters, range coupling units, antennae tuning houses, station con trol and remote control apparatus, and the concentric cables for transmission connection with the antenna towers. Federal Telegraph will organize three main installation crews to work in the East, Mid-West, and the Pacific Coast from north to south.

The Federal Telegraph contract covers the stations at: Washington, D.C.; Richmond, Va.; Raleigh, N.C.; Greensboro, N.C.; Spartansburg, S.C.; Minneapolis, Minn.; Spokane, Wash.; Charleston, S.C.; La Crosse, Wis.; Boise, Idaho; Alma, Ga.; Chicago, Ill.; Burley, Idaho; Jacksonville, Fla.; Goshen, Ind.; Delta, Utah; Melbourne, Fla.; Detroit, Michigan; Pueblo, Colo.; Miami, Fla.; Columbus, Ohio; San Diego, Calif.; Atlanta, Ga.; Indianapolis, Ind.; Los Angeles, Calif.; Chattanooga, Tenn.; Columbia, Mo.; Red Bluff, Calif.; Mobile, Ala.; Chanute, Kans.; Medford, Ore.; New Orleans, La.; San Antonio, Texas; Kylertown, Pa.; Brownsville, Texas; and Elmira, New York.

Ship's Weather Decking

(Continued from page 51)

and at the same time be wear-resistant. This is an important feature because of the frequent cases of personal injury due to slippery decks. Such accidents have necessitated payment by shipowners of large sums as compensation and resulted in serious injuries to men.

The special material which is embedded in the surface of Case Weather Decking provides a safe nonslip footing even when wet and when the ship has a considerable list.

Safety at sea in recent years has received a great deal of attention. New laws have been adopted which demand greater fireproof and other safety qualities in ship construction materials. Another Case Weather Decking is important from this point of view. It is resistant to the sparks and molten metal from burning and welding torches and red hot particles of carbon from smokestacks and diesel exhausts.

● **General.**

In ships that have reached a point where it becomes necessary to recaulk wooden decks, or resort to extensive scaling and painting of steel decks, the Case Weather Decking also may be installed satisfactorily, eliminating recaulking expense and providing a safe and protective surface good for many years.

In the case of a new ship, the Weather Decking may be installed over wooden decks without the necessity of caulking, and maintain a watertight deck for many years despite any working of the deck due to stresses.

Port of New Orleans and the Pacific Coast

Peculiar Needs of Each Section for the Products of the Other

By John Doherty

Through the Port of New Orleans, ranked second in the nation's commercial picture in 1936, pulsates the vital sustenance to industry, agriculture and business of the mighty Mississippi Valley and its far-reaching hinterlands.

During the seven month period, ending in July, 1937, the value of exports through the New Orleans district totaled $126,030,065, a gain of $37,283,959 over the corresponding period of 1936. Imports for the first seven months were $91,251,748, against $69,866,352 in 1936.

To earn its high ranking for 1936 among the nation's ports, New Orleans registered commodity exports valued at $167,281,190 and imports totaling $109,821,593. The total tonnage, including river and sea-borne exports and imports, was 14,331,737 net tons of cargo valued at $854,570,475. The 1936 total was $132,165,222 greater in value than that of 1935, and represented 1,413,114 tons more traffic.

Much of the increased traffic is attributed to the remarkable stimulus of Governor Leche's unique industrialization program which the state adopted under a constitutional amendment in November, 1936. Celebrating the first anniversary of the program this year, Louisiana counted $36,000,000 of outside capital invested in 57 new factories and added payrolls which ultimately will total $25,000,000 annually. This stimulating gesture to foster industrial expansion definitely marks the increased traffic through the port.

One of the nation's oldest ports, New Orleans has undergone a complete transformation since the turn of the century. Gone are the old wooden wharves and ramshackle warehouses. In their stead have risen mile after mile of modern concrete and steel wharves and sheds, fireproof and equipped with the newest technical developments for speedy and efficient dispatch of merchandise.

One of the greatest attainments of the port is the amazing decrease in fire losses since modern sprinkler systems were established throughout the docks, wharves and warehouses in 1930. Since that time, fire losses have totaled less than $100. During the twenty year period from 1910 to 1930, flames took a toll of $25,000,000 along the waterfront.

Strategically situated at the mouth of the Mississippi, the Port of New

Bird's-eye view of New Orleans. The southern port city nestles in a big bend of the Mississippi. 107 miles from the Gulf of Mexico, New Orleans has no tidal problems. Its levees have not been topped by the river for more than 100 years.

(Air Map Corporation Photo.)

Orleans brings the West Coast and the Orient approximately 600 miles closer to those who utilize its facilities. Entrance to the port is gained through South Pass, 107 miles below the city, or through Southwest Pass, 15 miles away. The former has a minimum depth of 30 feet and an average width of 750 feet, while Southwest Pass has a minimum depth of 5 feet and an average width of 00 feet. The passes are kept clear through the famed Eads Jetties, which since 1879 have maintained the proper depth.

Along the city's own waterfront, at Canal Street, the Mississippi is 20 feet wide and the harbor depth ranges from 100 to 180 feet in midchannel to from 30 to 60 feet at wharfside in low water.

The total waterfrontage of the harbor is 133 miles, of which 50 is on both sides of the river, 11 on the Inner Harbor Navigation Canal (Industrial Canal) and the rest along Lake Pontchartrain.

Bulk Cargo Facilities

Among the modern facilities which are available to New Orleans shippers is a reinforced concrete grain elevator of 2,622,000 bushels capacity which is completely equipped with the newest and most efficient aids for handling and storing grain. It includes a marine leg with both mechanical and pneumatic drives capable of delivering grain from cars and ships to the elevator at the rate of 20,000 bushels per hour. Operated in conjunction is a modern sacking plant with bin capacity of 0,000 bushels and sacking capacity of 7200 bushels per hour. The elevator has three loading berths and can deliver grain to vessels at the rate of 0000 bushels per hour.

For handling bulk commodities such as coal, coke, ore, and sulphur, the state has provided a bulk commodity plant, capable of transferring between ships and storage all commodities of this nature. It has a storage capacity of 25,000 tons.

The vegetable oil handling plant designed to bring such oils as peanut oil, palm oil, olive oil foots, ed and cottonseed oil direct ship's tanks to tank cars. There four pumps fitted to pump the from the ship's tanks into the wharf pipe line, which distributes the oil to tank cars through eight outlets spaced to conform to tank car centers. Steam for the pumps is furnished by the ship. Sixteen cars can be placed for loading simultaneously on the wharf's double tracks.

New Orleans, looking up and across the river from the Esplanade Avenue Dock at the business center skyline. River is 2500 feet wide here and 180 feet deep.

● Special Package Terminals

Other special equipment, necessitated by the port's leadership in each field, are the green fruit wharves which are wider than the regulation wharf in order to allow refrigerator cars to be brought directly into the sheds so that the 23,000,000 stems of bananas which move through the port annually can be handled most expeditiously; the public cotton warehouse which was erected at a cost of $6,500,000 to provide one of the world's largest cotton storage plants, covering 47 acres and having a capacity of 500,000 bales of high density cotton; and the world's most efficient coffee terminal, built in 1926 at a cost of $1,500,000, which allows ships to be unloaded at two levels and provides 591,000 square feet of handling space.

For general commodities there are 38,000 lineal feet of public wharves of which 29,000 lineal feet are provided with transit sheds, and an additional 27,600 lineal feet of private wharves of which 12,300 lineal feet are equipped with transit sheds. These facilities extend over eight miles of the harbor frontage and provide more than 10,000,000 square feet of space for the handling of commodities. They all are served with rail facilities.

The greater part of the wharf structure extends longitudinally along the east side of the river. Offering from 30 to 60 feet of depth at wharfside the docks are unique in engineering annals and were made possible by the unusually steep banks of the river at this point.

The standard width of the New Orleans wharves is 250 feet, including 200-foot width of shed, 20- to 30-foot width of wharf apron and a standard 30-foot reinforced roadway in the rear. Since only the green fruit wharves are allowed to have railroad cars enter the sheds, the roadway in the rear of the general commodity sheds is built at car-floor level and tracks of the Public Belt Railway parallel this roadway, while, on the wharf apron, in front of the sheds, shipside tracks have been provided wherever the need for them appears to exist. These are single-track or double-track as required, with adequate switches and cross-overs. Some fifteen wharves, so designated, are thus provided with shipside tracks.

Shed decks are of reinforced concrete and wharf aprons are of the same material wherever possible. Wharves generally rest on wooden piles which have practically an indefinite life in river water, but some of the newer construction, notably the new Poydras Street and Poland Street wharves have steel supports resting on concrete footing which in turn is supported by wooden pilings. Sheds have steel walls.

● **Steamer Services**

Direct service between New Orleans and the Pacific Coast is maintained by the Luckenbach Lines and the Gulf Pacific Lines, each of which maintains one sailing each week in each direction. In addition there are approximately 90 steamship lines operating regularly out of the port, connecting the city with all important world ports. Nearly 3,200 ships with a gross tonnage of 12,454,000 tons arrive and leave each year.

Included in these are the Lykes Companies, comprising the Lykes Brothers-Ripley Steamship Company and the Tampa Interocean Steamship Company, which operate more than 50 vessels to the United Kingdom, the Irish Free State, the Atlantic Coast ports of France, Germany, Holland, and Belgium, the Spanish peninsula, the Mediterranean, China and Japan, and Philippines and Hawaii.

The Mississippi River Shipping Company's Delta line is important in the trade between New Orleans and the east coast of South America and annually brings in upwards of 3,000,000 bags of Brazilian coffee.

Also important in the Latin American trade are the United Fruit Company and the Standard Fruit and Steamship Company. The former maintains an extensive freight and passenger service between New Orleans and the ports of Cuba, Jamaica, and Central America, while the latter offers similar service between Cuba, Mexico and Central America.

One of the unique services available to shippers is that of the Seatrain lines which offers rail-car ferry service between New Orleans, Havana and New York. The Seatrain eliminates stevedoring both at loading and discharging terminals. Loaded standard gauge freight cars are hoisted on the ships and transported to their destination, where they are replaced on tracks and sent on to the consignee. Between 1,200 and 1,500 tons of cargo now move between New Orleans and Havana each way weekly via Seatrain. Each ferry has carrying capacity for 100 cars.

Other important services in the New Orleans area are the Aluminum Line, which carries cargo to Haiti, the Dominican Republic, Jamaica, the lesser West Indies and the northern coast of South America, bringing back bauxite ore from the Guianas; the Munson Line, operating in the Yucatan sisal trade; the New York and Puerto Rico Steamship Line and the Waterman Line, each providing service to Puerto Rico; the Lloyd Brasiliero, which operates in the Brazilian coffee trade and brings American manufactured goods to South America; the North German Lloyd, the Swedish-America-Mexico Line, and the Japanese round-the-world liners of Osaka Shosen Kaisha.

Special cargo facilities at New Orleans. Upper: Banana unloaders. Lower: Vegetable oils.

In the coastwise traffic, besides Luckenbach and Gulf Pacific, there are the Morgan Line, which was the first of the American flag lines to operate out of Gulf ports; the Mooremack Line to Texas and Atlantic Coast ports; the Waterman Line to Atlantic Coast ports, and the Clyd Mallory Lines to Florida ports.

Pacific Coast shippers who are i terested in the development of South American or Central Ame ican trade can profitably use Ne Orleans either as a distributi point or as a point for transshipmen One of the unusual services offer by the port authorities frequent occurs when in the transshipment large lots of cargo the incoming ve sel is permitted to the berth of th outgoing vessel with the only ext charge imposed being a tolla charge of 15 cents per ton of 2,0 pounds.

With Latin America experienci its greatest industrialization mov ment, the south and the southwe rapidly assuming a dominating po tion in the nation's industri scheme, and Louisiana itself lea ing this southward expansion of i dustry through Governor Leche's e forts, the Port of New Orleans momentarily suffering "growi pains," as it daily becomes more a parent that the Crescent City w become the focal point for the wate borne traffic that is resulting fro this mass development. This ne and constantly growing market a fords a rich field for Pacific Coa shippers.

New Tankers Fathometer Equippe

The Submarine Signal Compa report the recent equipment of large number of new oil tankers wi their Echo Depth Sounding Fathom ter, including the tanker W. H. Be owned by the Standard Oil Compa of California, and many others the current shipbuilding progra

Some of the earliest commerci installations of the Fathometer ma more than twelve years ago were cable ships to which accurate a instantaneous soundings are inval able. Since that time more than 10 vessels of all types throughout t world have been Fathometer equ ped, including ocean passenger l ers, cargo carriers, yachts, tanke and fishing trawlers. The Fathom ter has long been considered st dard safety equipment for the m ern vessel.

On the Ways -

SHIPS IN THE MAKING

LATEST NEWS FROM AMERICAN SHIPYARDS

Encouraging Prospects

(Continued from Page 29)

lso in January the U. S. Maritime mmission signed long term operating subsidy agreements with seven lines operating in the overseas trade. These subsidies total $7,359,000 a year.

hort term agreements have been signed with seven additional lines for periods covering from two to nine months.

he long term agreements involve "definite replacement commitments" on the part of the contractors to build a total of twenty ships before [illegible]. Fourteen of these vessels must be started in 1938.

n addition to these must go vessels these seven companies are required to formulate plans for the building of some 23 more vessels during the rest of their contract periods.

ince writing the above, word comes from Washington that the U. S. Maritime Commission has consummated a long term operating agreement with the American Export Lines of New York City under which the firm agrees to build ten new cargo vessels in the next five years. Construction on four of these vessels is to start in 1938. The operating subsidy agreed upon is approximately $1,200,000 a year. The ten ships are unofficially estimated to cost about $20,000,000, and will probably cost considerably more money.

ecapitulating, then, we have a practically certain U. S. Maritime Commission shipbuilding program American shipyards in 1938 that include:

Twelve fast tankers	$37,500,000
Twelve cargo carriers	$30,000,000
Eighteen combination vessels	$60,000,000
Forty-two vessels	$127,500,000

Added to this total there is: A practical certainty of at least 20 commercial tankers and perhaps many more; a certainty of a large naval program of shipbuilding; a certainty of a large reconditioning program in existing ships; and a practical certainty of considerable building of new ships for coastwise and intercoastal services.

In Lloyd's Register shipbuilding returns for the quarter ending January 1, 1938, the United States was credited with 45 vessels having a total gross measurement of 204,134 tons. This placed United States in fifth place among the shipbuilding nations, the relative positions of the

Review of Tanker Markets

By OSCAR J. BEYFUS

San Francisco, Calif.,
January 15, 1938.

Since my review for you a month ago, we have had a slight cessation of chartering followed by active markets, in most trades, with upward rates.

TIME CHARTERS

A large dirty diesel gets 12/- for one year Pacific trading. Another diesel will receive 8/- for three years and another 9/- for two years. 7/- is to be paid beginning June for a diesel for 30 months. The ten year charters were consummated at 5/3 beginning '39 and 5/4½ beginning in the spring of '40.

VOYAGE CHARTERS

American—Gulf to North of Hatteras: In the past two weeks 37c was paid for kerosene and 39c for heating oil. Dirty rates in the same period rose to 33c and up to 36c for 30 gravity. Bunkers "C" paid as high as 39c and fuel below 10 gravity 41c.

Intercoastal: No transactions reported.

Foreign—Gulf to U.K./Continent: Clean rates in this trade went up to 32/6 and numerous dirty fixtures were steadily upward to 25/9.

California to U.K./Continent: Clean charters were recorded at 37/6 and 38/- with S.F. option 1/- higher.

Black Sea to U.K./Continent: Clean charters were made at 25/- and up to 32/3 while a dirty vessel gets 20/- and a small tanker 26/6.

Black Sea - Far East: Nothing reported.

Abadan - U.K./Continent: Clean charters reported at 40/- and dirty vessels at 32/-.

California - Australia and New Zealand: A large prompt clean boat reported at 28/6 - to Australia.

California - Orient: A clean fixture was made at 28/- Japan, 31/- Shanghai, 32/- Hong Kong/Philippines. Dirty charters dropped to a basis of 22/- Japan but the latest was a February-March boat at 27/-.

first four being as follows: Great Britain, 256 ships, 1,125,426 tons; Germany, 114 ships, 369,354 tons; Japan, 83 ships, 365,460 tons; and Holland, 92 ships, 288,938 tons.

With the 1938 program in force we will undoubtedly move up to second place in number and tonnage of ships building.

● Los Angeles Shipbuilding Delivers.

A steel hull barge designed for deliveries of oil in Los Angeles harbor was completed and delivered in January by the Los Angeles Shipbuilding and Dry Dock Company. The hull measured 139 feet by 40 feet by 14 feet and has an oil cargo capacity of 8,200 barrels.

Built for General Petroleum, she was christened Genpet Barge No. 3. She is equipped with a pumping outfit comprising two Kinney Heliquad type rotary pumps each having a capacity for 73,500 gallons of oil per hour. The power units for these pumps are two 100 horsepower Enterprise four cylinder full diesel engines, complete with air tanks, spark arresting silencers, mufflers, cooling water pumps, fuel oil and lubricating oil transfer pumps, and air compressors.

● Puget Sound Launching.

The Western Boat Building Company of Tacoma, Washington, on February 1 launched their Hull No. 130, a fine purse seiner 81 feet long by 20 feet beam by 9 feet 5 inches depth. This vessel is powered with a six cylinder Atlas Imperial 200 shaft horsepower diesel engine.

● Oakland Docks Busy.

Moore Dry Dock Company of Oakland reports for January the drydocking and/or repairing of 44 vessels. This yard has built up a fine reputation for promptness and economy in handling routine or special repairs on ships large and small. Their equipment is capable of handling the largest commercial ship and ship machinery work regularly entering San Francisco Bay. Located on the Oakland Estuary, they have quiet water at all times and ideal conditions for floating drydocks. There are no drawbridges between their docks and the bay, and no delays leaving or entering. All of these factors have combined to make Moore Dry Dock Company popular with shipowners.

● Sparrows Point Launches Tanker

On January 22 the Sparrows Point Plant of the Bethlehem Shipbuilding Corporation, Ltd. launched the second of four 13,000 deadweight ton tankers building for the Standard Oil Company of New Jersey. This vessel was christened R. W. Gallagher.

These four tankers are of the Frear-Bethlehem type, length 442 feet, beam 64 feet, depth 34 feet 10 inches, gross tonnage 7600, sea speed 12 knots. Six more tankers are under construction at Sparrows Point.

● Electric Boat Delivers Submarine

Submarine Salmon (SS182) was delivered January 5 to the U. S. Navy by the Electric Boat Corporation of Groton, Conn. Salmon is of the 1450 ton standard displacement type. Her keel was laid April 15, 1936. She was launched June 12, 1937. Seven other submarines are now under construction at this yard, the last contracted delivery date being February, 1940.

● A Federal Tanker Delivery.

Esso Houston, Federal's Hull No. 145 and the first of two tankers building at the big Kearney, N. J. yard for the Standard Oil Company of New Jersey, was delivered on January 15 after satisfactory trials. These ships are of the Isherwood Arcform type and are built to the Isherwood system of longitudinal framing.

They are 450 feet long, 66 feet 6 inches beam, and 34 feet 6 inches deep, with a deadweight capacity of 12,800 tons.

Federal has (in addition to the remaining tanker on the above order) eight large tankers and six torpedo boat destroyers.

● Alaska Steamship Reconditioning Program.

The Alaska Steamship Company has purchased from the Grace interests the steamer Charcas. This vessel, built in Los Angeles in 1919, is 410 feet long, 54 feet beam, 27 feet deep, with a gross measurement of 5555 tons. Reconditioning of this vessel for the Alaska passenger and cargo service, together with changes on two of their other steamers, is estimated to cost $750,000 and will be carried out in the yard of the Alaska Steamship Company at Seattle during this spring.

● New Contract For Tanker.

Manitowoc Shipbuilding Company of Manitowoc, Wisconsin, report the closing of a contract with Socony-Vacuum Oil Company of New York to build a tanker with 1500 H.P. propulsion machinery.

● Sun Deliveries and Launching.

The yard of the Sun Shipbuilding and Dry Dock Company at Chester Pa., is very busy with seven large tankers, including the three for Standard Oil of New Jersey ordered January 3. During January Sun delivered to the Atlantic Refining Company the large tanker J. W. Van Dyke. This ship is 521 feet 2 inches long between perpendiculars by 7 feet beam by 40 feet depth. She has a total deadweight capacity of 18,50 tons and is equipped with the steam turbo-electric drive by the General Electric Company.

This vessel is the first American turbo-electric tanker and the world's largest all welded ship. On a draft of 29 feet 6 inches she displaces 2 898 tons and has a cubic cargo capacity for 155,000 barrels (42 gal.) of oil. Her turbo-electric machinery will develop 5,000 shaft horsepower and drive the ship loaded at 1 knots. Her cargo pumping equipment has a total capacity to discharge 3 000 barrels an hour.

Also during January Sun delivered to the Standard Oil Company of Ca fornia the W. H. Berg, first of tw rs for that firm. Full illustrated scription of W. H. Berg will be in an article beginning on 30 of this issue.

January 29 the second Stan- Oil Company of California tan- as launched at the Sun yard hristened H. D. Collier.

ited Delivers ry and Sludge Craft.

ited Shipyards Inc. of New is building 3 ferries, 3 sludge vessels, and a fireboat for the City of New York.

The ferries are 267 feet long overall, 66 feet extreme beam, and 19 feet 9 inches depth of hull. One boat was delivered January 7. The other two are scheduled for delivery on February 11 and March 18, respectively.

The sludge vessels are 250 feet long on the water line, 43 feet 6 inches beam, 16 feet deep. One was delivered January 15. Schedule calls for deliveries of the other two on February 11 and March 11.

Bids for the Maritime Commission Standard Freighters

e table herewith shows the bids itted on the U. S. Maritime Com- on C-2 Standard Cargo vessel n. The bare figures tell a very ent story of something radic- vrong in the whole picture.

e bids of the Hess Welded Ship Barge Corporation of Philadel- and of the Tampa Shipbuilding any are quite close to the esti- s of the U. S. Maritime Commis- Neither of these firms has had ience in building ships of this acter.

xt in line upward is the Sun uilding and Dry Dock Com- bid. Then come a pair, Newport Shipbuilding and Dry Dock any of Virginia and the Gen- Engineering & Dry Dock Com- of San Francisco, almost iden- Then, higher up, another pair, ehem Fore River and United ards, very close to each other. latter pair becomes a trio, since Bethlehem's bid is for building either at Fore River or at the Union Plant, San Francisco, same price.

We have not had an opportunity to read the specifications or to examine the plans of the final modified designs as sent out to the bidders. It is reported that the causes of high cost are: Certain very stringent penalty clauses in connection with guarantees; certain very onerous provisions for thorough trials, commercially loaded at sea; and inherent expense in the nature of the design and the specified machinery and equipment.

Rigid fuel economy guarantees are required, with large penalties for each one hundredth of a pound of fuel per horsepower hour over the guarantee.

Trials for each ship on Navy test courses are required with the ship in commercial loaded condition. These trials to be not only for speed, but also for economy tests. Very stringent performance bonds are required of the contractors.

The design calls for a very low speed of propeller. This feature increases the weight and cost of the propeller, the line shaft, the tail shaft, all the bearings and pillow blocks of the line shaft, and the fittings for the stern tube. It makes necessary a large diameter propeller and raises the line shaft, making expensive supports necessary for the pillow blocks. It increases the weight and cost of the speed reduction gears.

These are items which we know could be reduced in cost with no reduction in propulsive efficiency and a possible increase in that factor as well as in steam rate of the turbines.

An interesting feature of these bids is the relation of the bid of the General Engineering & Dry Dock Company to the others. Sun Shipbuilding and Dry Dock Company did not bid on the steamers. Assuming that U. S. Maritime Commission decides to build at these prices and to apply the 6 per cent differential, the bids on four steamers each would be: Tampa, $1,748,527; Hess, $1,826 676; Newport News, $2,500,000; and General Engineering (adjusted 6%), $2,590,980.

If either Hess or Tampa should prove unreliable bidders, then General Engineering will come in for a share of these ships. If the Maritime Commission decides for policy purposes to spread the work, or the Atlantic Coast yards are not able to guarantee deliveries, then, too, General Engineering will get a number of the ships.

At any rate, here we are close to some actual contracts to build ships in Pacific Coast yards.

	Hess	Tampa	Sun	Newport	Bethlehem Fore River	Bethlehem Union	United	General
team:	1,856,675	2,028,972		2,800 000	3 240,000	Same	3,400 000	2 880,500
	1,836,675	1,861,656		2,630,000	3 003,000		3,190,000	2,811,000
	1,831,670	1,790 645		2,550,000	2,895 000			2,780,300
	1,826,676	1,748,527		2,500,000	2 822 000			2,767,000
iesel:	1,902,675	2,129,458	2,447,589		3,593,000	Same		3,030,000
	1,887,675	1,946,126	2,397,589		3,355,000			2,946,700
	1,872,675	1,864,565	2,364,258		3,250,000			2,915,000
	1 857.675	1.815,653	2,347,589		3,165,000			2,897,300

Bids on U. S. Maritime Commission cargo carriers. From top to bottom in each group the figures are for one ship, and for each of 2, 3, or 4 ships.

Building in American Yards

Pacific Coast

BETHLEHEM SHIPBUILDING CORPORATION, LTD.

(Union Plant)
San Francisco

NEW CONSTRUCTION: **Hull 5355—McCall (DD400).** Launched November 20, 1937; completion date March 1, 1938. **Hull 5356—Maury (DD401);** completion date June 1, 1938. Two 1500-ton destroyers for U. S. Navy; length, 341′ 3⅝″; beam, 35′ 6⅛″; depth, 19′ 8″. Cost $3,675,000.

DRYDOCK AND ROUTINE REPAIRS: **Coya, President Van Buren, Tug Standard No. 1, M.S. Gausdal, Santa Rosa, Zacapa, D. G. Scofield, Pat Doheny, Tug Sunbeam, M.S. Trondanger, Turrialba, Stm. Sch. Caspar, Yorkmar, Abangarez, Santa Paula, Charcas, Atenas.**

FELLOWS & STEWART, INC.

Wilmington, Calif.

NEW CONSTRUCTION: **Contract No. 663. 65 foot pleasure fishing boat** for charter. Main engine Fairbanks-Morse, with two Ford V8 conversions for auxiliary power. **Completion date Febraary, 1938.**

Contract No. 644, 65 foot combined passenger and party boat. Completion date May 1, 1938.

DRYDOCK AND ROUTINE REPAIRS: **W. T. Co. Blanche W., yacht Los Cerritos, yacht Astrild, purse seiner White Rose; 48 smaller yachts and commercial boats.**

GENERAL ENGINEERING & DRY DOCK CO.

Foot of Fifth Avenue
Oakland, Calif.

DRYDOCK AND ROUTINE REPAIRS: **Makua, Isthmian, Virginian, Ferry Issaquah, Genl. Frank M. Coxe, Gas. S. Excel II, Rose Marie, Tug Arabs, Siskiyou, Noyo, El Segundo.**

HONOLULU IRON WORKS

Honolulu, T. H.

DRYDOCK AND ROUTINE REPAIRS: **Chapaiev, Steel Age, Buffalo Bridge, Admiral Halsted, President Taft.**

LAKE WASHINGTON SHIPYARDS

Houghton, Wash.

DRYDOCK AND ROUTINE REPAIRS: **Yacht El Primero, Barge Diamond Head.**

LOS ANGELES SHIPBUILDING & DRY DOCK CORP.

Los Angeles Harbor
San Pedro, Calif.

NEW CONSTRUCTION: **Hull No. 57,** one steel harbor barge 139′ x 40′ x 14′; 8,200 bbl. capacity; for General Petroleum Corp. of Calif. **Delivered January, 1938.**

DRYDOCK AND ROUTINE REPAIRS: **Dorothy Philips, Sch. Lottie Carson, M. V. Minato Maru, Lebec, Yacht Happy Days, San Felipe, Yacht Haida, La Brea, Edwin B. De Golia, Phyllis Soto, Marit, Kishacoquillas.**

MARE ISLAND NAVY YARD

Mare Island, Calif.

NEW CONSTRUCTION:

Sturgeon, Submarine (SS187); keel laid October 27, 1936; estimated delivery September, 1938.

Swordfish, Submarine (SS193); keel laid October 27, 1937; estimated delivery date August 1, 1939.

Order received for construction of two harbor tugs, YT 133 and YT 134, October 7, 1937.

DRYDOCK AND ROUTINE REPAIRS: **Indianapolis, Borie, Perry, Trever, Wasmuth, Zane, Cincinnati, Arctic, Duane, Brant, Sandpiper, Lightship No. 76, Porpoise, Nautilus.**

THE MOORE DRY DOCK CO.

Oakland, Calif.

DRYDOCK AND ROUTINE REPAIRS: **Alaska Standard, West Nilus, Georgian, Manulani, W. P. Barge No. 2, S. C. T. Dodd, Barge Maltha, Washingtonian, Santa Fe Barge 7, Patterson, Elizabeth, Brunswick, Frances, A. Mackenzie, West Mahwah, San Clemente, Oregonian, Fermia, Iowan, Delarof, Richmond, Hercules, Delta King, El Aquario, Santa Fe Barge No. 6, Silver Teak, West Ives, Silverguava, La Purisima, General Sherman, Californian, Crusader, North Cape, Pacific Grove, Rally Sea Breeze, Olympic, San Angelo, Rio Del Mar, Primus, Margaret F., Axel Johnson, Lake Frances, Anne Johnson, Sherman Rose, Dante Alighieri, Pennsylvanian, Sitka, Llandaff, Benkalis, Tug Virgil G. Bogue, Angel Island, Port Orford, Transit, Arkansan, Coloradan, Silvermaple, Mexi Hawaiian Standard, Daphne, Shosh**

THE PUGET SOUND NAVY YAR

Bremerton, Washington

NEW CONSTRUCTION:

U.S.S. Wilson (Destroyer No. 4 standard displacement, 1500 tons; laid March 22, 1937.

Destroyer No. 428; standard displ ment 1600 tons; order placed by N Department December 7, 1937.

DRYDOCK AND ROUTINE PAIRS: **Ranger, Pensacola, Min polis, Haida.**

TODD SEATTLE DRY DOCKS, I

Harbor Island
Seattle, Wash.

DRYDOCK AND ROUTINE PAIRS: **Edgar F. Luckenbach, Luckenbach, Katrina Luckenbach, Neptune, American Reefer, M. Norco.**

WESTERN BOAT BUILDING CO.,

2505 East 11th Street
Tacoma, Wash.

NEW CONSTRUCTION:

Hull No. 130, purse seine fis vessel 81 x 20 x 9.5 ft.; powered b H.P. Atlas 6 cylinder diesel. Keel October 10, 1937; **launched Feb 1, 1938.**

DRYDOCK AND ROUTINE PAIRS: **Fishing boats Valencia, Ultka, Argo, Emblem, Carlisle.**

Atlantic, Lakes, Rive

THE AMERICAN SHIP BUILD COMPANY

Cleveland, Ohio

NEW CONSTRUCTION: **Two lake freighters** 610′ x 60′ x 3 2,000 I.H.P. geared turbine, water boilers, 400 lbs. pressure, electric iliaries; for Pittsburgh Steamship pany. Keels laid June 21, 1937; July 6, 1937; launching dates N ber 10 and December 2, 1937; de date April 15, 1938.

BATH IRON WORKS

Bath, Maine

NEW CONSTRUCTION: Hulls

162, and 163; **DD394 Sampson,** 5 **Davis** and **DD396 Jouett**; Three ton destroyers for U.S. Navy; date ontract September 19, 1935. ated delivery dates June, August ctober, 1938, respectively; launch- ates indefinite; **DD396**, keel laid, 26, 1936. **DD395**, keel laid July 936. **DD394**, keel laid April 8,

Hulls Nos. 170-171, DD409, Sims, **D410, Hughes, two 1500-ton de-** rs for U. S. Navy; contract date er 12, 1936; keels laid July 15 eptember 15, 1937, respectively; hing dates, indefinite; delivery April, 1939, and June, 1939, re- vely.

Hulls Nos. 177 and 178, DD423 and **D44, two 1620 ton destroyers for** U. vy. Contract date September 30, delivery dates April and June, respectively.

ETHLEHEM SHIPBUILDING CORPORATION

Fore River Plant,

Quincy, Mass.

NEW CONSTRUCTION:

7, Wasp, Airplane Carrier for U.S. nment; keel laid April 1, 1936; ated delivery, November, 1938.

Hull 1463, U. S. Army Hopper **e Goethals**; 5000 cubic yards ca- ; keel laid October 5, 1936; hed August, 1937; **delivered De-** **er, 1937.**

Hulls Nos. 1467, 1468, 1469, three **nger and freight steamers for Pan-** Railroad S.S. Co.; 486 feet x 64 38 feet 6 inches; 16½ knot speed. laid Nos. 1467 and 1468, Octo- 5, 1937; No. 1469, November 15,

Hulls Nos. 1470 and 1471, two 1500 **estroyers** for U. S. Government; ry dates March, 1940 and May,

ETHLEHEM SHIPBUILDING CORPORATION

Sparrows Point Plant

Sparrows Point, Md.

NEW CONSTRUCTION: **Two oil** rs—steam—425'x64'x34' for Gulf orp.; total tonnage 7070 each; hing dates October 9 and Decem- 1, 1937.

r 13,000 deadweight ton steam **e driven tankers** for Standard . of N. J.; length 442', beam 64', 34' 10", gross tonnage 7,600, 12 knots. Esso Baton Rouge ed November 13, 1937. **R. W.** **her launching date January 22,**

tanker for Texas Co.; about deadweight tons; steam turbine.

BOSTON NAVY YARD

Boston, Mass.

W CONSTRUCTION:

402, Mayrant, and DD403, Trippe, ght destroyers for United States LPB 334'; beam 35'6"; depth "; keels laid April 15, 1937; ated delivery dates August, 1939 and October, 1939, respectively.

DD415, O Brien, and **DD416, Walke,** two destroyers; LBP 341', beam 36', depth 19'8"; delivery dates indefinite.

DD425, Madison, and DD426, Lansdale, two destroyers; 341'0" x 36'0" x 19'8".

One harbor tug for U. S. Navy; 98'0" LBP x 24'0" x 13'6"; delivery date 1938.

BROOKLYN NAVY YARD

Brooklyn, N.Y.

NEW CONSTRUCTION:

CL 48, **Honolulu, light cruiser**; L.B. P. 600'; beam 61'8"; standard displacement 10,000; geared turbine engines; express type boilers; keel laid September 10, 1935; launched August 26, 1937; estimated delivery, August 1, 1938.

CL 50, **Helena, light cruiser**; L.B.P. 600'; beam 61'7¾"; standard displacement 10,000; geared turbine engines; express type boilers; keel laid December 9, 1936; launching indefinite; contract delivery, September 16, 1939.

BB 55, **North Carolina,** battleship; L.B.P. 714' 0"; beam to outside armor 108' 0"; std. displ. 35,000 tons; geared turbine engines; express type boilers. Keel laid October 27, 1937; launching date indefinite; contract delivery August 1, 1941.

CHARLESTON, S. C., NAVY YARD

Charleston, S.C.

NEW CONSTRUCTION:

Order placed for **one harbor tug**; LOA 124' 9", length between perpendiculars 117', breadth, molded, 28', depth, molded, 16'; keel laid August 2, 1937.

Order placed for **one harbor tug**; LOA 110' 3"; LBP 98' 0"; breadth 24' 0"; depth at side amidships 13' 6". No dates set.

Order placed for one **harbor tug**; 65 feet long.

DEFOE BOAT & MOTOR WORKS

Bay City, Mich.

NEW CONSTRUCTION:

One diesel yacht, powered by 1,000 h.p. Winton engines; 143' long, 23' beam; steel construction. For Cox and Stevens, New York, N.Y. Delivery date May 1, 1938.

THE DRAVO CORPORATION

Engineering Works Division

Pittsburgh, Pa., and Wilmington, Del.

NEW CONSTRUCTION:

Hulls Nos. 1435-1439; five type W-4 welded steel coal barges 175' x 26' x 10'8"; for stock; 2360 gross tons.

Hulls Nos. 1440-1444; five type W-4 welded steel coal barges 175' x 26' x 10'8"; for stock; 2360 gross tons.

Hulls Nos. 1446-1448; three maneuver boat hulls for U. S. Engineer Office, Louisville, Ky.; 219 gross tons.

Hulls Nos. 1449-1452; four welded steel oil barges 195'x35'x9'6" for stock; 1956 gross tons.

This makes a total of 17 hulls with a total gross tonnage of 6895 tons.

ELECTRIC BOAT CORP.

Groton, Conn.

NEW CONSTRUCTION:

Hull No. 26, Salmon, SS182, standard displacement 1450 tons; keel laid April 15, 1936; launching date June 12, 1937; delivered **January 5, 1938.**

Hull No. 27, Seal, SS183, standard displacement, 1450 tons; keel laid May 25, 1936 launched August 25, 1937; delivery date, March, 1938.

Hull No. 28, Skipjack, SS184, standard displacement, 1450 tons; keel laid July 22, 1936; launching date October 23, 1937; delivery date June, 1938.

Hull No. 29, Sargo (SS188); keel laid May 12, 1937; delivery date June, 1939.

Hull No. 30, Saury (SS189); keel laid June 28, 1937; delivery date July, 1939.

Hull No. 31, Spearfish (SS190); keel laying date September 9, 1937; delivery date September, 1939.

Hull No. 33, Seadragon (SS194); 1450 tons; delivery date December, 1939.

Hull No. 34, Sealion (SS195); 1450 tons; delivery date February 1940.

THE FEDERAL SHIPBUILDING AND DRYDOCK COMPANY

Kearny, N. J.

NEW CONSTRUCTION:

One destroyer, **DD383 Warrington**; 1850 tons; keel laid October 10, 1935; launching date, May 15, 1937.

Three destroyers, **DD397 Benham, DD398 Ellet and DD399 Lang,** estimated completion, April, June and August 1938; keels laid DD397, September 1, 1936; DD398, December 3, 1936; DD-399, April 5, 1937.

Two 12,800-ton tankers for the Standard Oil Company of New Jersey; 450' x 66'6" x 34'6"; Isherwood Arcform design of hull form and longitudinal hull framing.

Hull 145, Esso Houston, keel laid June 7, 1937, launched December 18, 1937; **delivered January 15, 1938**; Hull 146, keel laid August 16, 1937; launching date March, 1938.

Two destroyers, DD411 and DD412.

Hulls Nos. 149-150, two 12,900 ton tankers for Pan American Petroleum & Transport Co.; Isherwood Arcform design of hull form and longitudinal hull framing. Estimated completion date October, 1938. No. 149, keel laid November 15, 1937.

THE INGALLS IRON WORKS COMPANY

Birmingham, Ala.

NEW CONSTRUCTION:

One 35-ton whirler derrick barge for U. S. Engineers Office, Huntington, W. Va.; 110' x 52' x 8'. Launching date September 21, 1937; **delivered December 30, 1937.**

One steel vegetable oil barge for New York Tank Barge Co., N. Y.; 650 gross tons; capacity 1250 tons; 195' x 42' x 12'. Estimated launching date November 1, 1937; **delivered.**

JAKOBSON & PETERSON, INC.
Brooklyn, N.Y.

NEW CONSTRUCTION:

One all welded steel diesel bulk oil delivery launch for Socony-Vacuum Oil Co.; 55′ x 13′ 6″ x 7′ deep; 60 HP Model 36A Fairbanks-Morse engine, 3:1 reduction gear; launched December, 1937; **delivered January 3, 1938.**

LEVINGSTON SHIPBUILDING CO.
Orange, Texas

NEW CONSTRUCTION:

One all welded towboat for Pan American Petroleum & Transport Co., Texas City, Texas; 64′11″, beam molded 18′, depth molded 7′6″; equipped with 380 H.P. Atlas Imperial diesel engine. **Delivered January, 1938.**

One all welded work barge 54′ x 18′ x 5′, for Shell Petroleum Corp. **Delivered January, 1938.**

MANITOWOC SHIP BUILDING CO.,
Manitowoc, Wis.

NEW CONSTRUCTION: **One tanker** for Socony-Vacuum Oil Company, Inc., New York; 1500 H.P.

THE MARYLAND DRYDOCK CO.
A Subsidiary of Koppers Company,
Baltimore, Maryland

NEW CONSTRUCTION: **One double ended steel diesel ferry boat,** 208′ x 62′ x 9′, for the Claiborne-Annapolis Ferry Company; keel laid September 15, 1937; launched December 11, 1937; delivery date May, 1938.

THE NEW YORK SHIPBUILDING CORPORATION
Camden, N. J.

NEW CONSTRUCTION:

Three light cruisers; Hull No. 412, Savannah (CL42), Hull No. 413, Nashville (CL43), and **Hull No. 416 Phoenix (CL46)** of 10,000 tons each for the U.S. Navy Department; keels laid, 1935. **No. 412,** launched May 8, 1937; **No. 413** launched October 2, 1937.

One destroyer tender for U. S. Navy; order placed December 27, 1937.

One seaplane tender for U. S. Navy; order placed December 27, 1937.

NEWPORT NEWS SHIPBUILDING & DRYDOCK CO.
90 Broad Street, New York

NEW CONSTRUCTION:

H360 aircraft carrier, CV6, Enterprise, for U.S. Navy.; keel laid July 16, 1934; launched October 3, 1936; delivery date May, 1938.

H361, light cruiser, CL47, Boise, keel laid April 1, 1935; launched, December 3, 1936; delivery date July, 1938.

H362, light cruiser CL49, St. Louis; keel laid December 10, 1936; delivery date April, 1939.

Hulls Nos. 363-364, two destroyers, Nos. 413, Mustin, and 414 Russell; keels laid December, 1937; delivery dates April and June, 1939.

Hull No. 367, diesel electric tank vessel for Standard Oil Co. of New Jersey; length 260′6″; beam 43′6″; depth 18′3″. Keel laid September, 1937; launched December 8, 1937.

Hull No. 369, twin screw mail, passenger and cargo liner for United States Lines Co.

Hulls Nos. 370, 371 and 372, three oil tankers for Standard Oil Company of New Jersey; gross tonnage about 11,000 tons; L.B.P. 525′; breadth molded 75′; depth molded 39′.

PHILADELPHIA NAVY YARD
Philadelphia, Pa.

NEW CONSTRUCTION:

CA45 Wichita, L.B.P. 600′, beam 61′ 9¾″, depth molded at side to main deck amidships 42′0⅜″, draft corresponding to normal displacement 21′ 10″; standard displacement 10,000; **estimated completion January 1, 1938.**

Order placed for **DD404,** 1500 ton destroyer; no dates set.

PORTSMOUTH N. H., NAVY YARD
Portsmouth, N. H.

NEW CONSTRUCTION:

SS185 Snapper, submarine; keel laid July 23, 1936; L.B.P. 300′, beam 26′, loaded draft 15′ 7″; launched August 24, 1937; commissioned December 15, 1937; date of completion March 1, 1938.

SS186 Stingray, submarine; keel laid October 1, 1936; L.B.P. 300′, beam 26′, loaded draft 15′7″; launched October 6, 1937; date of completion June 1, 1938.

SS191, Sculpin, submarine; contract period started December 1, 1936; L.B. P. 302′6″, beam 26′10″, loaded draft 16′8″; keel laid September 17, 1937; completion date June 1, 1939.

SS192, Squalus, submarine; contract period started December 1, 1936; L.B. P. 302′6″, beam 26′10″, loaded draft 16′8″; completion date August 1, 1939.

SS196, Searaven, submarine; completion date February 1, 1940.

SS197, Seawolf, submarine; completion date April 1, 1940.

THE PUSEY & JONES CORP.
Wilmington, Del.

NEW CONSTRUCTION:

Two single screw, steel freight steamers for the Philadelphia and Norfolk Steamship Co., Philadelphia, Pa. L. O. A. 292′, L.B.P. 280′, beam 48′6″, depth 32′ 3″, draft 18′; geared turbine dr 4000 S. H. P.; 2 water tube boil Delivery dates 12½ and 13½ mont respectively. Keel laid for first s May 20, 1937; **launched Febru 1938.**

SUN SHIPBUILDING AND DRY DO COMPANY
Chester, Pa.

NEW CONSTRUCTION:

Hull No. 160, one oil tanker (stea 520′x70′x40′ for Atlantic Refining C 18,500 tons; keel laid March 22, 19 launched November 20, 1937; **delive January, 1938.**

Hull No. 167, one steam tan for Standard Oil Company of Cali nia; 462′4″ x 65′ x 35′; 12,800 t deadweight; **launching date January 1938; delivery date February 20, 19**

Hull No. 168, One diesel tanker stock account, equipped with S Doxford engine; 542′5″ x 70′ x 4 18,360 D.W.T. Keel laid Septembe 1937; delivery date June 1, 1938.

Hull No. 169, one oil tanker (stea 520′ x 70′ x 40′; for Atlantic Refin Co.; 18,500 tons; keel laying date Oc ber 11, 1937; delivery date, Septemb 1938.

Hull No. 170, one single screw ste tanker for Bernuth, Lembcke Co., In New York; length 462′4″; beam mold 65′ 0″; depth molded 35′ 0″, DWT a proximately 12,900 tons. Keel laid Se tember 20, 1937; delivery date Ju 1938.

Hull No. 171, one single screw ste tanker for Tide Water Associated Co.; 462′ 4″ x 65′ x 35′; 12,900 dw delivery date July 6, 1938.

Hulls Nos. 172, 173 and 174, th **tankers** for Standard Oil Co. of N Jersey; steam turbine; 525′ x 75′ x 3 16,300 dwt. Delivery dates April, 19 November, 1939, and April, 1940, spectively.

UNITED SHIPYARDS, Inc.
Staten Island, N.Y.

NEW CONSTRUCTION:

Hulls Nos. 840, 841, and 842; th ferry boats for City of New York; 2 overall, 66′ extreme breadth, 1 depth; keels laid April 4, April 27, a May 1, 1936, respectively. 840 and 8 launched May 7 and June 3, 1937; 8 **launched December 20, 1937;** deliv **dates January 7, February 11,** a March 18, 1938, respectively.

Hulls Nos. 850, 851, and 852, th **sludge vessels** for City of New Yo Department of Sanitation. Length W L. 250′. Beam 43′6″, Depth Keel laying dates, April 14, May and July 22, 1937, respectively; laun ing dates November 22, 1937, **Janu 4 and February 1, 1938,** respective **delivery dates January 15, 1938, F ruary 11** and March 11, 1938, resp tively.

Hull No. 856, fireboat for City New York. Estimated keel laying d March 22, 1938; estimated launch date June 28, 1938; estimated deliv date August 20, 1938.

Dependable
Insurance
Since 1863

Fire · Automobile · Marine · Casualty · Fidelity · Surety

FIREMAN'S FUND GROUP
Fireman's Fund Insurance Company — Occidental Insurance Company
Home Fire & Marine Insurance Company
Fireman's Fund Indemnity Company — Occidental Indemnity Company

New York · Chicago · SAN FRANCISCO · Boston · Atlanta

Strength
Permanence
Stability

How Marine Insurance Saved the Whaling Business

To show how heavily shipping leans on the broad and ample shoulders of marine insurance, an incident of 1871 is recalled involving whalers of Alaska and San Francisco's 75-year-old Fireman's Fund Insurance Company.

In the summer of 1871, forty whaleships had entered the Arctic through Bering Strait, bound for Point Barrow. They skirted the Alaskan coast through a narrow channel of open water, playing hob with the whales and laying in prospective fortunes for owners and masters.

Thirty-two of these whalers concentrated near Point Belcher. One had turned toward Siberia, and seven others had lingered in a place of comparative safety. On August 11 the wind shifted and the new ice began closing in, but it grounded, and notwithstanding warnings from the Eskimos, the 32 ships stayed on at the harvest of oil and bone. On August 29 the wind drifted the ice toward them again, this time in an unhalting, irresistible movement. On September 2 a barque was ground to pieces. A few days later another followed. On September 14 all souls aboard, including families of several of the masters, a company of 120 men, women and children, in more than 200 whaleboats, abandoned the doomed vessels and made their way to the seven that had stopped 80 miles behind and were still in a position of retreat. Some of these people reached the Hawaiian Islands and some San Francisco; but the vessels were all lost but one, which was found intact the following year.

Several whaling companies failed, and the rest were sick of the whaling business, and insurance men were afraid to touch it. Atlantic Coast companies pretty generally declined to insure any more whalers, unless exempted from liability "for loss or damage occasioned by ice," which nullified the value of the policies to the shipowners. And that added to the embarrassments of the whaleship owners. Without real insurance they hated to go on, but had nothing else to do.

Little of this insurance had been written at San Francisco. The Fireman's Fund had one vessel in the lot, and some reinsurance on another. It was not a serious matter, but it served to call attention to the troubles of that sort of business. Whalemen were now begging for insurance and couldn't get it. They were willing to place it in San Francisco or anywhere else.

Captain Cory Willisstun, an old-time whaler and a member of the Fireman's Fund marine committee, knew whaling and whalers, and he knew the Arctic. He discussed the situation with the marine secretary, and his diagnosis was:

"They wanted a full load of oil, and stayed too long and followed the whales too far; and when the season had ended they couldn't get out. If we could find some way to make those fellows come out before the new ice forms, the business would be safe enough."

A clause was composed for insertion in the whaling policy, reading:

"Warranted to be south of the latitude of St. Paul's Island September 15, and this company shall not be responsible for any loss or damage occurring north of that latitude and later than that date."

Under these restrictions, which all concerned recognized as reasonable, the company felt safe to proceed. The effect was magical. It brought in most of the whaling business, it made fast friends of all the whalemen. They admired the company's courage and boasted of being its customers. They had been begging insurance without avail. Now they could get it by consenting to a reasonable limitation, which the disaster of 1871 inclined them to observe anyhow. Ultimately the whales became so scarce that it was necessary for the whalemen to remain in the Arctic two or three years, and the restriction became obsolete.

Marine Insurance in All Phases — "All Risks" . . . Inland Marine . . . Ocean Marine

STANDARD MARINE INSURANCE COMPANY, LIMITED
NATIONAL UNION FIRE INSURANCE COMPANY
MERCANTILE INSURANCE COMPANY OF AMERICA

GEO. E. BILLINGS CO.

Pacific Coast General Agents—Richard J. Lutich, Marine Manager

GArfield 3646
308 California St.
SAN FRANCISCO

TRinity 1521
Spreckels Bldg.
LOS ANGELES

SEneca 1478
Colman Bldg.
SEATTLE

MARINE DEPARTMENT
AETNA INSURANCE CO.
QUEEN INSURANCE CO.
MARITIME INSURANCE CO., LTD.
FIDELITY PHENIX FIRE INS. CO.
Commercial Hull Dept.
AUTOMOBILE INS. CO.

Mathews & Livingston

Marine Underwriters

200 BUSH ST. SAN FRANCISCO
Offices at: Colman Bldg. - Seattle 111 West 7th St. - Los Angeles

Errors of Radiobeacon Bearings

The December 1, 1937, issue of the Hydrographic Bulletin, published by the Navy Department, contains an interesting article entitled "Errors of radio direction-finders," from which the following paragraphs are quoted:

> The early mistrust of radio direction-finders has been overcome, modern navigators regard them as indispensable. So far as usefulness is concerned, this faith is well founded, but in the matter of accuracy too much has been taken for granted. . . .

And in conclusion:

> It may be that the shipboard installation is inherently less accurate than the shore direction-finder. There is no reliable data concerning relative performance of the two types, but the difference is probably slight. In any event, the average of a number of bearings taken aboard ship will be considerably more reliable than a single bearing furnished by a shore station. Radio-beacons in the United States outnumber shore direction-finders two to one and are supplemented by numerous broadcasting stations operating in the band covered by shipboard direction-finder apparatus, which is an additional reason for preferring to navigate by the radiobeacon system.

With these general conclusions the experience of the Lighthouse Service which operates the radiobeacon system for use in connection with direction-finder installations aboard ship is in accord. However, the series of observations in the referenced article having been made solely with direction-finders installed ashore, it seems appropriate in support of the general conclusions above quoted to point out that in addition to greater opportunity afforded through the use of the installation aboard ship for repeated direction-finder observations, there exists also the greater opportunity for integrating the results of direction-finder observations with the results of other observations made by and known to the navigator, but manifestly not equally available to the operator of a direction-finder installed ashore, such observations being inclusive of soundings, last previously recorded astronomical sights, and dead reckoning including judgments as to wind and current effect. All such observations in addition to the repeated direction-finder observations will give the navigator a material advantage over the observer ashore in detecting any occasional or accidental large errors in direction-finder bearings.

With respect to the lack of reliable data as to the relative performance of the two types of installation, and in the absence of more conclusive data than has been or can readily be obtained, it may be worthwhile to point out that the sources of serious error most necessary to be guarded against may be quite different in the two methods of installation and use of the direction-finder, and it would appear incorrect to assume that al errors are reciprocal in the two methods of use of radio navigation by direction-finder. For example, the conclusion seems justified tha "overland" or "coastal" errors are materially less important source o over-all error in the case of direction-finder observations taken from ship at sea without intervening hig land between it and the radio-beaco on a radiobeacon ashore, than in the case of the shore installation of th direction-finder.

In October 1927 extensive radio beacon tests were made from 100 ve sels on the Great Lakes, and thes included 332 bearings which passe in part over land. These bearin partly overland were found to substantially as correct as the bea ings entirely over water, althoug many of the bearings crossed la

(Page 84, please)

Running Lights of Pacific Shipping

Ship Executive

CHARLES L. WHEELER, executive vice president McCormick Steamship Co. and Chas. R. McCormick Lumber Co. Born in Wisconsin . . . came to Coast to prepare treatise on this area for dictionary firm . . . remained to sell "cutover" land. Started with McCormick at St. Helens, Oregon. To San Francisco in 1920 to organize lumber company's shipping interests. Named executive vice president in 1935. Has served as president of S. F. Rotary, District Governor and director of Rotary International.

Foreign Trade Builder.

MICHAEL J. BUCKLEY, vice president in charge of traffic of Dollar Steamship Lines . . . he need bow to none as authority on cross-Pacific—round-the-world cargo movements . . . Born and schooled in San Francisco. One of the original South of Market Boys. Joined Pacific Mail in 1902. With Dollar for 16 years. Our readers will remember his inspired poem "A Day at the Farm" (P.M.R., December, 1937). A hiker . . . and he hikes!

Shipping Organizer

F. W. KUTTER, general manager of Fred Olsen Line, began his career in shipping with G. W. McNear back in 1900. Organized the present service in 1915 with one ship . . . now six of them bear testimony of his success in the transportation field . . . running to Liverpool, London, Hull and Norway. No hobbies, but likes the great out-of-doors. Brought up in San Francisco . . . married.

Employers' Leader.

ALMON E. ROTH, president-executive of Waterfront Employers Association . . . Pacific American Shipowners Association. For 18 years comptroller of Stanford, which college he entered in 1908, working his own way through. Varsity football squad . . . crack relay man in track! Practiced law seven years. The new Comptroller of Pacific Shipping since March 10, 1937—and doing a grand job!

Traffic

NEIL S. LAIDLAW, Traffic Manager for Swayne & Hoyt, Ltd., started steamshipping with old Pacific Coast Co. in 1914; U. S. Army, 1917-19; steamship business in Japan, 1919-1925; joined Swayne & Hoyt in 1926. S & H services: Gulf Pacific Line, Calmar Line, Yamashita Line. In Middle West Swayne & Hoyt are soliciting agents for Silver-Java-Pacific Line and Royal Netherlands. Neil was born in San Francisco; lives in Oakland. Hobby—home and garden.

Navigation Equipment.

J. F. McCONKEY, Pacific Coast manager for Sperry Gyroscope Co., Inc., joined this organization 19 years ago as service engineer. Opened Great Lakes station in 1919; started Seattle office in 1922; took over S. F. office in 1924; became West Coast manager in 1927. Expanding business now finds "Mac" directing sales and service in Pacific range—both marine and aviation equipment. Home is Burlingame. Hobbies, golf and bridge.

Propeller Club of California Hears Talk by Roger D. Lapham

The first luncheon-meeting under the newly installed administration was an auspicious event with **Roger D. Lapham,** guest speaker, the magnet which attracted an unusually large attendance. In his audience were several executives of Pacific Shipping lines . . . present to hear Mr. Lapham's analysis of the Coast maritime situation.

The speaker emphasized the earnest desire of employing operators to deal fairly with labor, paying tribute to the sincerity of Almon E. Roth, who is now president-executive of the employing group. **C. M. LeCount,** our new leader, presided.

● **New Program Builders.**

Fletcher Monson has been named to the highly important post of Chairman of the entertainment and program committee. His committee as appointed consists of **Joseph Coney, Bern De Rochie, Richard Glissman, Monroe Paulson,** and **Russell Pratt.**

The Chairman of the Golf Committee will soon be named . . . along with his aides.

Junior past-president **Edward H. Harms,** who rendered invaluable help to the 1937 membership committee, will have the chance to keep up the good work of signing 'em on the dotted line this year. He has been appointed Chairman of Membership. Personnel of his committee will soon be announced.

Your 1938 Board of Governors:
C. M. LeCount, president.
C. E. Finney, vice-president.
Stanley E. Allen, secretary-treasurer.
George A. Armes
Capt. Henry Blackstone
W. H. Brann
Joseph J. Coney
B. N. DeRochie
Erik Krag
Cyril Meek
Herman D. Nichols
George E. Swett
Walter Walsh
L. L. Westling
Harold Weule

Flash!

The good ship
Propeller Club
Changes her Moorings
to the banquet room of
St. Julien Restaurant
at 140 Battery Street
85c (Includes sales tax and tips)
Fine food . . Ideal location
Next Meeting February 8th
Hear Capt. Walter H. Allen of the
12th Naval District!

E. T. FORREST PROMOTED

Ed Forrest, who for many years has been Marine Paint representative for The Paraffine Companies, Inc., in the Bay District, is on the road to recovery from a broken leg incurred some six months ago.

He will be transferred to the Northwest about March 1, headquartering at Seattle. Ed will have the entire paint line, including Marine Paints, for Washington, Idaho, and Montana.

No doubt it will be impossible for Ed to stay away from the waterfront, so he will probably be found at least 50 per cent of the time around the Washington ship yards.

WM. GROUNDWATER

William Groundwater, director of transportation, Union Oil Company of California, was recently appointed general chairman of the Harbor, Foreign Commerce and Shipping Committee of the Los Angeles Chamber of Commerce, and a director of the Chamber. Groundwater has been an active member of the Chamber of Commerce since he came to Los Angeles in 1922, and since that time has been attached to the shipping section, of which he was chairman in 1936 and 1937.

FOURTH ANNUAL DINNER OF SPERRY FIFTEEN-YEAR CLUB

On Wednesday, January 19, the fourth annual dinner of the Sperry Fifteen-Year Club was held at The Livingston, 309 Schermerhorn Street Brooklyn. **Mr. O. B. Whitaker,** President of the Club, presided.

At this dinner thirty-eight men and women who had recently completed twenty years of employment with the Sperry Gyroscope Company each received a gold watch or a silver service in recognition of their loyalty and contributions to the Company's success. **Mr. R. E. Gillmor,** President of the Company, made the presentations.

Since the plan for honoring length of service was inaugurated, the number of those eligible to attend thi annual affair has grown from 169 t 208, and of these, 105 have completed twenty years or more of service. Altogether upwards of 3900 employee years were represented at the dinner

THREE GENERAL ELECTRIC PROMOTIONS

Announcements of three new appointments to posts within the manufacturing organization of the General Electric Company have been made at Schenectady by **W. R. Burrows,** vice-president in charge o manufacturing, as follows: **A. T Chandonnet,** secretary of the manufacturing committee, to be assistan manager of the Elmira Foundry Company, Inc., of Elmira, N.Y., an affiliated company; **Giles S. Maxwell** present supervisor of costs, to succeed Chandonnet as secretary of the manufacturing committee; and **Thomas D. Foy,** on special assignment in the manufacturing organization to succeed Maxwell as supervisor o costs. The appointments were effective January 1, 1938.

Chandonnet has been secretary o the manufacturing committee since October, 1935. He is a native of Manchester, N.H., and a graduate o Tufts College, class of 1924, with the degree of B.S. in civil engineering Following his graduation that year he entered the employ of Genera Electric through the business training course and subsequently fille positions in the accounting and cos departments.

Names and News

N. WARNOCK

The United States Lines has anunced the appointment of A. N. Warnock, member of the freight dertment staff of its London office, t the post of manager of the freight dpartment at Liverpool, to succeed G. Elliott, who retired on Decemr 31 after 38 years of service.

Warnock spent several months in te company's head office at New rk last summer, familiarizing himlf with the freight organization re and contacting American imrters.

ENRY CANGARDEL

Henry Cangardel, general manager the French Line, and a widely own personality in the United ates, has been elected president of e Marine Academy of France, acrding to advices received by Henri orin de Linclays, French Line genal manager in the United States d Canada.

Like the famous Academie Franise, the Marine Academy has forty members, including admirals, naval architects, technicians, engineers and administrative officials — the most distinguished men in the French shipping field. The group concerns itself with a thorough practical and theoretical study of both the Merchant and Military Marines. A similar marine academy existed in France under Louis XIV, but this gradually dissolved. Its high standards and traditions, however, are adhered to by the present Academy, which was organized over ten years ago.

* * *

Cangardel is more than qualified for this new honor, being an outstanding leader in the shipping world and a tireless student of marine problems. He has written a great deal on the subject, one of his most noteworthy works being a standard and authoritative book dealing with the role played by the Merchant Marine during the World War.

HARPER McNEILL

Following the company's present expansion program in the passenger field, Harry S. Scott, president of General Steamship Corporation, Ltd., has announced the appointment of Harper McNeill as district passenger agent at Seattle. The company has recently taken on important agency connections in the steamship and tour fields, including the Colombian Line, between Panama, West Indies, and New York; the Delta Line, between New Orleans and Brazil and Argentina; Furness Line, between New York, Bermuda and South America; and Burns-Philp Company, between Australia and Java.

McNeill was formerly manager of Thos. Cook and Sons in St. Louis, having later worked with that firm in New York City, where he was entrusted with important assignments as conductor on round-the-world cruises.

In his new capacity he will have under his jurisdiction the Washington, Idaho, Montana and British Columbia territory and will work under the direction of R. S. Wintemute, the company's vice-president in the Northwest.

★ ★

TO THE
MERCHANT
MARINE

IT'S ANOTHER ASSOCIATED SERVICE

THE same friendly, helpful spirit of service that has won fame for Associated ashore is maintained in our relations with the marine trade. Call your Associated representative in any port and take advantage of Associated's long line of high quality marine products and Smiling Associated Service.

CONVENIENT
MARINE DISTRIBUTING STATIONS
AT
SEATTLE · SAN DIEGO · PORTLAND
SAN FRANCISCO · OAKLAND · SAN PEDRO
TACOMA · HONOLULU, T. H. · MANILA, P. I.

TIDE WATER ASSOCIATED OIL COMPANY

★ LISTEN TO THE ASSOCIATED BASKETBALL SPORTCASTS ★

Diehl sales meeting in session.

Diehl Celebrates 50th Year

Commencing the celebration of its Golden Anniversary, the Diehl Manufacturing Company, Elizabethport, New Jersey, held a general sales conference at the Elizabethport plant, starting Thursday, January 6th, and continuing until Tuesday, January 11th. The conference was called by **Frank B. Williams, Jr.,** Vice-President and Sales Manager to discuss plans for the sales promotion and advertising of the Company's many electrical products.

The Diehl Manufacturing Company is the Electrical Division of the Singer Manufacturing Company. They are pioneer manufacturers of Electric Motors, Generators and Fans for industrial and marine use, and distribute their products throughout the entire United States.

A Golden Anniversary Sales Dinner given at the Elks' Club Auditorium, Elizabeth, New Jersey, on Friday evening, January 7th, was attended by approximately 170 men of the sales and manufacturing organizations. The principal speaker, **Frederick J. Diehl,** nephew of the founder, who is in charge of the Company's experimental work, reminisced on the history and development of the Diehl Manufacturing Company. He was followed by **Charles C. Remsen,** Assistant to the President, who also described some of the early history of the company. Both talks were illustrated with lantern slides showing old Diehl electrical equipment.

A feature of the dinner was the presentation of twenty-five year service buttons to six employees. The presentations were made by **F. B. Williams, Jr.,** Vice President and Sales Manager, to the following: **Myron W. Buchanan,** Manager of Factory Sales; **John B. Bretz,** of the Punch Department; **Frank A. Cotton,** of the Sales Department; **Charles Ellender,** of the company's Chicago office; **Rudolph Friedman,** of the Drafting Department; and **Harold Phillips,** of the Production Department.

SHIP PHINEAS PENDLETON

Old S.F. Ship is Calendar Theme

The beautiful painting from the brush of Charles R. Patterson, today's most famous marine artist, portrays one of those inspiring events in the life of a sailing ship—the beginning of a voyage.

As sail after sail on the Phineas Pendleton is set, she gradually takes a larger bone in her teeth and soon the harbor of San Francisco will fade from view. In the picture, the Red Stack tug which has towed her beyond the harbor traffic is now wallowing in the swell while her crew hauls the tow line aboard.

Captain William H. Blanchard, of Searsport, Maine, one of seven brothers, all shipmasters, was master of the Phineas Pendleton when she was burned at Manila, in August, 1885. He had four sons, all born at sea, and all became shipmasters. Captain Phineas B. Blanchard, known to his friends as Captain Banning Blanchard, one of these sons, is now an official of the firm of Turner and Blanchard, Inc., of New York.

Captain Banning Blanchard describes this ship as follows: "The American ship, Phineas Pendleton, was built at Brewer, Maine, in 1866, in what was then known as the Dunning Ship Yard.

"A fine ship, 1332 tons net register; 185 feet long; 37 feet beam, and 23 feet deep. She was built entirely of oak.

"She crossed the main skysail yard and was a handsome ship. Although designed as a cargo carrier she made a number of fine passages.

"Her first commander was Phineas Pendleton, Jr., son of the owner. She was later commanded by Captain A. Nichols, Captain J. Laffin, and last by Captain William H. Blanchard. Her several commanders were hard drivers, and never lost an opportunity to carry sail.

"At the age of 19 she was still classed as an A-1 ship, and had she not burned would no doubt have lasted many more years."

XZIT

Fire Scale and Soot ERADICATOR

These XZIT Offices for Your Convenience:

BALTIMORE, MARYLAND:
Chamber of Commerce Building
(Calvert 5829)

BOSTON, MASSACHUSETTS:
11 Farnsworth Street
(Hubbard 9032)

DETROIT, MICHIGAN:
1627 W. Fort St.
(Randolph 3540)

HOUSTON, TEXAS:
423 Broadway
(Wayside 3966)

SAVANNAH, GA.:
11 West Bay Street
(Tel. 8811)

HONOLULU, T.H.:
919 Bethel St.

PORTLAND, ORE.:
45 S. W. First Avenue

SEATTLE, WASHINGTON:
1241 Railroad Ave. South

NORFOLK, VIRGINIA:
59 Commercial Place

LOS ANGELES, CALIF.:
178 E. 59th Street
(Century 25227)

NEW ORLEANS, LOUISIANA:
916 South Peters Street
(Raymond 3203)

PHILADELPHIA, PENNSYLVANIA:
1215 Commercial Trust Bldg.
(Rittenhouse 2496)

SAN FRANCISCO, CALIFORNIA:
58 Main Street
(Sutter 8800)

CHICAGO, ILL.:
407 South Dearborn St.
(Harrison 4977)

CLEVELAND, OHIO:
9101 Detroit Avenue
(Woodbine 1738)

MOBILE, ALA.:
57 North Water Street
(Dexter 3779)

When the XZIT man comes aboard!

A nationwide organization of trained men stands ready—at principal American ports—to demonstrate the advantages of steaming without the costly handicap of soot and fire scale — advantages which are saving money for operators of tankers, luxury liners, freighters—steamers of all classifications.

● XZIT

This scientific combination of chemicals eliminates soot, cracks off existing scale and prevents new scale from forming. Used and endorsed by leading Engineers in both Marine and Industrial fields. We will gladly demonstrate Xzit to you. Phone or write for full information.

XZIT SALES COMPANY
Hoboken, N.J.
1031 Clinton Street

XZIT PACIFIC COMPANY
779 Bryant Street, San Francisco
SUtter 7338

Names and News

FRED C. KOBELY SUCCEEDS DR. PARKER AT BETHLEHEM

Dr. W. E. Parker, Jr., resigned January 15 from Bethlehem Shipbuilding Corporation, Ltd., after twenty-two years service, and retired to his ranch near Hollister. He organized and handled the work of the industrial relations department. Among other duties his activities covered the field of compensation, safety, employees' pensions, employees' relief plan, and employment and welfare for the San Francisco, Alameda, and San Pedro works of Bethlehem Shipbuilding Corporation.

Fred C. Kobely, who has been connected with Bethlehem Shipbuilding Corporation for more than twenty years in an executive capacity, has been appointed to succeed Dr. Parker. Kobely's work in the organization is known to his many friends throughout the Pacific Coast shipbuilding industry. His connection with Bethlehem's operating deartment has given him intimate contact not only with yard operations but with the personnel.

GRACE LINE PERSONNEL CHANGES.

The following changes, involving transfers and promotions of executives of the Grace Line on the Pacific Coast, were announced recently by Edward T. Ford, vice-president, and Fred L. Doelker, Pacific Coast manager of the Grace Line.

Fred M. Rohrer, assistant Pacific Coast manager, has been transferred to New York to become assistant to the executive vice-president.

Guy E. Buck, manager of the Grace Line in Los Angeles, was transferred to San Francisco as assistant Pacific Coast manager, succeeding to the position held by Rohrer. Buck was here for many years with the Grace interests as freight traffic manager, and is widely known among San Francisco shipping interests.

Clay Hutchison, general passenger agent in San Francisco, was transferred to Los Angeles as manager of the office there. Hutchison is as well known in Los Angeles as in San Francisco transportation circles, as he served the Grace Line for many years in the south before coming to the San Francisco offices.

Harry Thompson, assistant manager in Los Angeles, has been transferred to Seattle as assistant manager. Thompson was for many years connected with the North-west office before being appointed to his Los Angeles position.

The transfers became effective on February 1.

J. W. CRICHTON.

After a short illness J. W. Crichton, dock superintendent for Swayne & Hoyt in Portland, died during the early part of January. He had been engaged in transportation work since 1894, from 1920 to 1928 being district agent for the United States Shipping Board in Portland. At the time of his death he was 57 years of age.

ROBERT C. THACKARA.

Appointment of Robert C. Thackara of New York City as assistant director of operations and traffic of the United States Maritime Commission has been announced.

He is widely known in shipping circles as an operations and traffic expert. Formerly he was vice-president of the Luckenbach Steamship Co., a position he held for 14 years, and for nine years was chairman of the Intercoastal Conference, an organization which was dissolved upon the enactment of the Merchant Marine Act, 1936. While associated with the Luckenbach Company he spent five years on the Pacific Coast, with offices in San Francisco.

J. J. COUGHLIN.

A recent arrival in Seattle was J. J. Coughlin, port superintendent at Stockton for Luckenbach Steamship Company, Inc., who was transferred to the former city as Puget Sound marine superintendent for the line. He replaces G. J. Ackerman, who resigned to become assistant to the vice-president of Pacific American Fisheries at Bellingham. Coughlin has spent 18 years with Luckenbach, formerly being marine superintendent in Seattle for a period of three years.

GENCO WINCH NAMES AGENT

General Engineering and Dry Dock Company, San Francisco manufacturers of the Genco Power Winch for Lifeboats, have appointed C. C. Galbraith & Sons, Inc., of 99 Park Place, New York, as their sales representatives.

The Galbraith organization and their branch offices will act as agents for the Genco Winch on the East Coast and in the Great Lakes and Gulf maritime districts.

OSCAR J. BEYFUSS.

Formerly manager of the tanker department at San Francisco for Williams, Dimond & Co., Oscar J. Beyfuss has opened his own offices at 244 California Street in that city. He will be engaged as a ship and oil broker and ships' agent.

S. B. PILCHER

Replacing Reginald Back, who resigned and left for his home in New Zealand last December, S. B. Pilcher, former assistant secretary to the general manager of the Canadian-Australasian Line (Union Line) has succeeded to the post of general representative of the line, with headquarters at San Francisco.

EARL ANDERSON.

Appointment of Earl Anderson as district passenger agent in the Portland district for General Steamship Corporation was recently announced, together with announcement of enlarging the office in that city to cover the entire corner of the Lewis Building. Anderson was formerly with the Portland office of Pacific Steamship Company, where he filled the same post, later becoming associated with E. A. Gardner, then general passenger agent of States Line in that city.

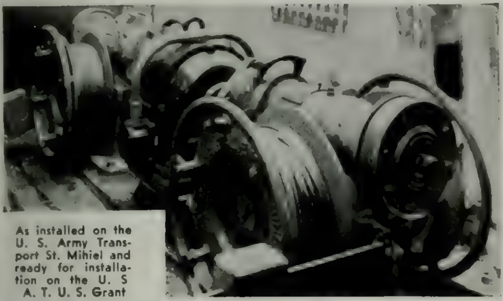
V. A. Driscoll is manager of the Portland office for the company.

CHARLES H. HURST.

Appointment of Charles H. Hurst, former general agent for Panama Pacific Line at San Francisco, to traffic manager of the Central California Traction Company, Stockton, has been announced. He succeeds K. B. Flamm, resigned.

THE Genco POWER AND HAND WINCH

. . . for launching life boats aboard your ships *will more than meet requirements*



As installed on the U. S. Army Transport St. Mihiel and ready for installation on the U. S A. T. U. S. Grant

GENCO WINCHES have been subjected to vigorous tests from which they have triumphed over all lifting and lowering requirements . . . WITH A SUBSTANTIAL EXTRA FACTOR OF SAFETY.

GENERAL ENGINEERING & DRY DOCK CO.

1100 Sansome Street, San Francisco — Foot of 5th Avenue, Oakland — Foot of Schiller St., Alameda

Eastern, Great Lakes and Gulf Ship Operators are invited to communicate with C. C. Galbraith and Sons, Inc., 99 Park Place, New York

---

HUNT-SPILLER

Air Furnace Gun Iron

A special material built to meet severe requirements. Its uniform quality and unsurpassed wear-resisting properties insure maximum service, highest efficiency, minimum fuel consumption and low maintenance costs.

Steam or Diesel.—You need something more than ordinary material to combat the severe action of high temperatures and high pressure developed inside the cylinders of your engines.

Application of HSGI liners, heads, pistons and piston rings to your main or auxiliary engines offer big savings in cost of operation.

HUNT-SPILLER MFG. CORPORATION

V. W. ELLET
Pres & Gen. Mgr.
383 Dorchester Ave.

E. J. FULLER
Vice President
South Boston, Mass.

R. R. Wells
2905 Piedmont Ave.
Berkeley, Calif.

Thos G. Baird
16 California Street
KF-1142
San Francisco

HUNT-SPILLER *Air Furnace* GUN IRON

The 1938 Lifeboat Winch

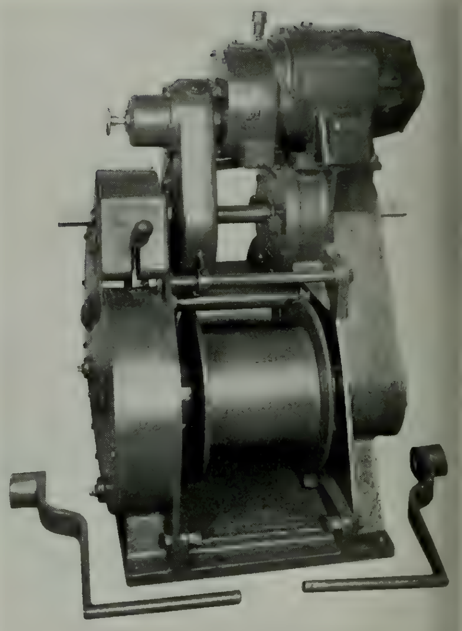
Ship architects, builders, and owners will be interested in the new 1938 A-E-CO Life Boat Winch recently introduced by American Engineering Company.

This life boat winch offers many exclusive advantages. It more than meets the requirements of the Bureau of Marine Inspection and Navigation and has been fully approved by that Bureau.

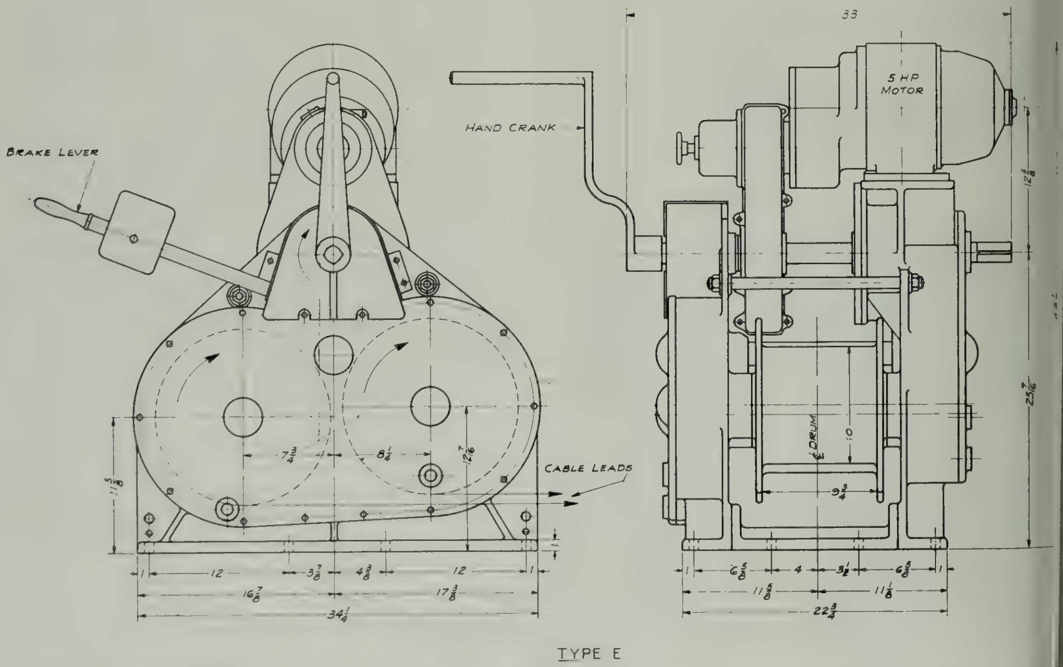
In details of design and construction, the A-E-CO Life Boat Winch fully meets the high standards of dependable performance of all A-E-CO auxiliaries. It is supplied in three types:

Type B (electric drive with provision for hand operation); Type H (for hand operation only); and Type P (for power operation from a deck winch or for hand power).

(Page 82, Please)



Above: End view of the A-E-CO lifeboat winch. Below: End and side elevations, showing overall dimensions.



The American-Hawaiian Steamship Company uses Pabco's nti-corrosive and anti-fouling bottom paints on some of the fine hips flying their historic house flag. S.S. Columbian is shown.

Pabco Bottom Paints
Give Vital Protection

Two finishes protect below-the-water sections—first, anti-cor-osive, a powerful rust inhibitor; also prevents galvanic action. Second, anti-fouling paint, resists marine growths. Results, greater speed —lower fuel costs.

Marine Products

NTI-CORROSIVE, ANTI-FOULING TOP SIDE PAINTS
. . . LINOLEUMS . . . MASTIPAVE FLOORING

THE PARAFFINE COMPANIES, INC.

SAN FRANCISCO LOS ANGELES
PORTLAND SEATTLE

FOR FAST, DEPENDABLE SERVICE TO
ALL PARTS OF THE WORLD, SHIP

French Line

FAMOUS FOR 74 YEARS

Moroccan Service • Mediterranean Service • North Pacific Coast Service • West Indies, Cuba and South America Service • Mexico, Cuba, Spain Service.

New York to England, France, and thus to all Europe:

NORMANDIE
(World's Largest and Fastest Ship)
ILE DE FRANCE
PARIS
CHAMPLAIN
LAFAYETTE
DE GRASSE
(Calling at Ireland)

•

General Agents for Messageries Maritimes, Chargeurs Reunis and Compagnie Sud-Atlantique, Air-France.

FRENCH LINE
Main Office: 610 Fifth Avenue
(Rockefeller Center)
New York
Freight Office:
19 State Street, New York

In Philadelphia it's the

HOTEL PHILADELPHIAN

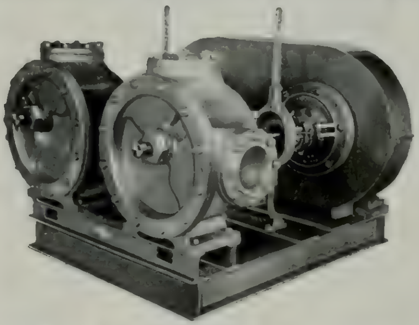
Highly recommended by experienced travelers the world over for its warm hospitality; its excellent cuisine served in comfortably Air-Conditioned Restaurants; its convenient location to the business section; and its unlimited parking facilities.

600 ROOMS *with bath from* $2.75 *up*

DANIEL CRAWFORD, JR.
MANAGER

39TH AND CHESTNUT STREETS
PHILADELPHIA, PA.

VIKING
BUILDS BETTER PUMPS



BETTER PUMPS HAVE BUILT VIKING

The performance of over 600,000 Viking Rotary Pumps has built the world's largest exclusive rotary pump factory. Viking economy and dependability has been proved in practically every field of industry. Is it any wonder that Viking leads the entire list of all rotary pumps? Write today for complete bulletins.

2038 So. Santa Fe Ave., Los Angeles, Calif.

Pacific Coast Distributors
DE LAVAL PACIFIC CO.
61 Beale Street, San Francisco, Calif.

VIKING PUMP CO.
CEDAR FALLS, IOWA.

Literature of the Industry

Brown Pyrometers, catalog No. 1102 of The Brown Instrument Company, describes and illustrates their pyrometers of the potentiometer and millivoltmeter types for indicating, recording and controlling temperatures in industrial processes and in power generation. Brown instrument users have at command a nation-wide sales and service organization.

Commercial Tank Heads and Boiler Heads, a 30-page book issued by the Commercial Shearing and Stamping Company to describe their line of forgings and medium and heavy weight metal products formed by stamping, cold working, machining and/or welding.

Tank heads, cold formed in solid dies, for riveted or welded tanks, boilers and non-fired pressure vessels up to 64 inches outside diameter, can be furnished from stock or promptly manufactured in any quantity.

Many interesting forms of stampings for application in welded assemblies are shown. Stampings are obtainable in rolled carbon steel, stainless steel, Everdur, Herculoy, aluminum, copper, Monel metal, and clad metals.

The Art of Proportioning, a new 24 page edition of the catalogue of D. W. Haering and Company, describing the operation, construction and application of H-O-H Feeders operated by pressure difference between pitot tubes employing the famous Haering fluid piston principle.

This new edition discusses the application of the hydraulic piston and fundamental design requirements for the accurate proportioning of any solution into liquids or gases. The booklet is profusely illustrated with pictures of operating installations and drawings of various models and applications of proportioning machines.

Proportioning units for the introduction of boiler compounds, hot water treatments, acids, dyes, inhibitors, hypochlorites, coagulants and alkalies are discussed in detail. Simplicity of design and expression are outstanding characteristics of the book.

New 1938 specifications for the popular Model "B" Feeder, the new automatic Model "WW," and the new agitator Model "S" Feeders are described for the first time.

Smoother Sailing, a booklet published by the Korfund Company, Inc., and containing much information that never before has appeared in print, shows for the first time typical arrangement of isolation of main propulsion diesel engine. Other applications include isolations of main engines, isolation of auxiliary diesels and all types of marine machinery. Booklet also includes complete technical data on Korfund Vibro Dampers and Korfund Type "T" Seismo Dampers.

This new Korfund booklet should prove of value to marine engineers, naval architects, owners, and oper tors of marine diesel vessels.

Built Together Pump, bulletin 55 of Fairbanks, Morse and Compan illustrates their new unit assemb of Fairbanks-Morse electric mot and F.M. double stage centrifug pump, a very efficient combinati built and tested as a complete un and covered with a single guarante The pump is designed to work at hi speeds against heads up to 475 fe with liquids of low viscosity and fr from excess foreign matter.

Kinney Liquid and Vacuum Pump bulletin 15 of the Kinney Manufa turing Company, describes and illu trates their rotating plunger pum Heliquad pumps, high vacu pumps, strainers and clutches. Spec fications and dimensions of all the products are given in detail.

Copies of any of the above may obtained free on application to Pa fic Marine Review, 500 Sansome S San Francisco, California.

New Norwegian Tanker

European yards are turning out many fine tankers these days. A noteworthy example is that Norwegian motor tanker Ora pictured herewith.

This beautiful ship had a successful trial trip and was delivered on December 17 last, sailing almost immediately in ballast for Aruba, where she was to take on a cargo of the lighter distillates for Stockholm.

Ora is of approximately 15,000 tons deadweight capacity, being 490 feet 0 inches in length, 62 feet inches in beam, and 36 feet 7 inc in molded depth.

She was built for S. H. Smith-S ensen of Areudal, Norway, by famous Kokums Shipyard of Malm

Her propulsion machinery cons of one double acting, two cycle, kum-M.A.N. diesel directly conn ed to the propeller screw and de oping 4500 shaft horsepower at revolutions a minute. This plant drive the ship loaded at 13 knots speed.

PLANT

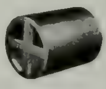
PLANT RUBBER & ASBESTOS WORKS

SALES OFFICES
SAN FRANCISCO LOS ANGELES
OAKLAND WILMINGTON

FACTORIES
SAN FRANCISCO LOS ANGELES
REDWOOD CITY

ASBESTOS SUPPLY COMPANY
DISTRIBUTORS AND APPLYING CONTRACTORS
PORTLAND SEATTLE TACOMA SPOKANE

Mo-Lo



The Perfect Piston Iron
No Blow Holes, No Waste and Machines Easily.
294 Sizes in Stock.
Ask for our stock list.

TRADE LESLIE MARK

PRESSURE REDUCING VALVES
PUMP GOVERNORS
TEMPERATURE REGULATORS
SELF CLEANING STRAINERS

TRADE TYFON MARK
WHISTLES
SIGNALS

LESLIE CO., FOUNDERS AND MANUFACTURERS
LYNDHURST, N. J.

John H. Marvin Co.
1016 First Ave. So.
Seattle

Llewellyn Supply Co.
245 Fries St.
Wilmington, Calif.

BRONZE - BRASS - MONEL
TAIL SHAFT LINERS
PUMP LINERS - BUSHINGS

SANDUSKY FOUNDRY & MACHINE CO.
SANDUSKY, OHIO

CORDES BROS.
200 DAVIS STREET SAN FRANCISCO

FRANCE

TRADE MARK

"Thirty-Nine Years Satisfactory Performance"

Manufactured exclusively by

FRANCE PACKING COMPANY
Main Office and Factory
TACONY, PHILADELPHIA

Represented by
SAN FRANCISCO—HERCULES EQUIPMENT & RUBBER CO.
550 - 3rd Street—EXbrook 2575
SEATTLE—GUY M. THOMPSON
1241 Railroad Ave., South—Phone MAin 1870
PORTLAND—E. B. HUSTON
127 S. W. First Ave.—Phone ATwater 6754

"A million now in use"
MORE POSITIVE DISTRIBUTION and GREATER DIFFUSION of AIR with the Thermotank

PUNKAH LOUVRES

Because the Thermotank Punkah Louvre adjusts instantly to any desired position, air convection, direction and distribution are positive. Stratification of air cannot exist when the Thermotank Punkah Louvre is used. This directional air conveyor insures complete diffusion of air, with no dead "spots" within the large area of its distribution. The Thermotank Punkah Louvre prevents drafty currents; CONTROLS the direction and convection of air. It requires little wall or ceiling space, and each louvre can be directly controlled, thus insuring the desired amount of air distribution within its range. You get the air where you want it, ONLY with the Thermotank Punkah Louvre.

Write for Booklet

KELVIN-WHITE COMPANY
Sole United States Distributors
90 STATE STREET BOSTON, MASS.

Worthington Acquires Turbine Corporation

Worthington Pump and Machinery Corporation of Harrison, New Jersey, has recently announced the acquisition of an interest in the Moore Steam Turbine Corporation of Wellsville, New York. This association adds to the list of products sponsored by Worthington an extensive line of steam turbine equipment and in turn provides Moore with the benefit of Worthington's resources in matters pertaining both to application and metallurgy.

In the formal announcement of this acquisition, C. E. Searle, vice-president of Worthington, stated: "It is the determination of both Moore and Worthington to continue the steady progress of development which has characterized the policy of Moore Steam Turbine Corporation throughout its existence. The fine reputation which Moore products enjoy in many industries, including petroleum, chemical, public utility and shipbuilding, is based upon a standard of quality which will be maintained."

And Develops a New Pump Unit

A unique compact pumping unit for bulk transfer service where both thin and highly viscous liquids are handled has been developed by Worthington Pump and Machinery Corporation. The pump is of the herring-bone-gear-impeller type driven by a constant-speed motor or internal combustion engine through a two-speed, enclosed transmission. For light liquids the pump may be operated at high speed, while for viscous liquids the speed of the pump may be reduced. In either case the full power of the prime mover is employed.

In conventional applications of single pumping units on such service, motors are selected for the heaviest loads and are operated at a fraction of their rated power when pumping the thinner liquids. The new two-speed unit affords maximum efficiency because a relatively small constant-speed driver is used.

Various applications of these units have proved satisfactory, due to the self-priming high-suction qualities and positive displacement features in the pump. There are no valves to retard the liquid flow, and the entire unit requires little space.

Plastic Putty

A new plastic compound has been developed by Maas & Waldstein Company to take the place of putty and other substances used for cementing glass to glass, metal, or wood, calking crevices, making joints of various kinds, and other purposes.

This new compound, which is known as Plasticalk, does not, like putty, dry, harden, crack, shrink, and lose its bond with age, but retains its plasticity and adhesiveness indefinitely. It is unaffected by water or humidity, and does not support fungus-growth. It is easily applied with an ordinary putty knife, and, when in place, will not sag or flow, even if heated by a nearby electric lamp. It adheres strongly to glass, metal and wood.

DOLLAR STEAMSHIP LINES

EXPRESS FREIGHT-PASSENGER AND REFRIGERATOR SERVICES

ROUND-THE-WORLD

ATLANTIC-FAR EAST
TRANS-PACIFIC

INTERCOASTAL
MEDITERRANEAN - U. S. A.

Dollar Steamship Lines Inc., Ltd.

ROBERT DOLLAR BLDG., SAN FRANCISCO - DOuglas 6000

OFFICES & AGENCIES THROUGHOUT THE WORLD

BOSTON
CHICAGO
CLEVELAND
DETROIT
LOS ANGELES

SEATTLE
NEW YORK
PORTLAND, ORE.
WASHINGTON, D.C.

The most potent bulwark ever raised against scale and corrosion in the battle for efficient and economical marine boiler operation—

The HALL MARK signals victory for shipowners thus protected!

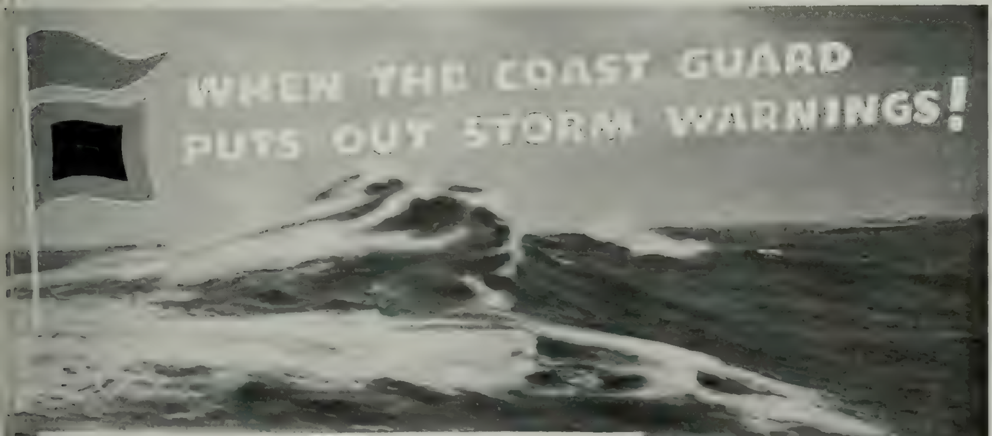
Today 224 vessels have eliminated mechanical boiler cleaning expense because their owners realize the value of the HALL SYSTEM OF BOILER WATER CONDITIONING.

The Hall Laboratories has earned the confidence and respect of every shipowner it is serving.

Bull & Roberts
117 Liberty Street
New York

Hall Laboratories, Inc.
981 Folsom Street
Phone GArfield 7027
San Francisco

Hagan Corporation
Bowman Building
Pittsburgh, Pa.



WHEN the barometer's falling and the seas are getting up. Herculite Tempered Plate Glass is a comforting glass to have in portlights, deckhouse windows and windscreens. For Herculite is four times as strong as normal plate glass of the same thickness. It's a seaworthy glass . . . ideal for use wherever glass is employed on your craft. You can obtain it through any of our numerous branches and through the branches of W. P. Fuller Co. on the West Coast. Or get full information about it by writing Pittsburgh Plate Glass Company, Grant Building, Pittsburgh, Pa.

HERCULITE
Tempered Plate Glass

The Tanker W. H. Berg

(Continued from page 39)

steam turbines, one is a standby reciprocating steam pump.

Ample storage for fresh make up feed water is provided in double bottom tanks under the engine room space, and an ample supply is further insured by the installation of a large capacity salt water evaporator and distiller, and a fresh water distilling set, all by the Davis Engineering Company.

The entire machinery space on this ship is a maze of piping. All of the service pumps for the various piping systems of the ship are in this space, except the oil cargo pumps. Drinking water piping, sanitary piping, salt water piping for tank washing, distilled and evaporated feed water piping, main steam piping, and auxiliary steam piping, fuel oil piping, and lubricating oil piping are all stowed away in the engine room. Most of the valves in these piping systems are of Powell manufacture.

● **Auxiliary Machinery.**

The generator flat on this tanker is on the port side of the engine room, and is 29 feet 6 inches above keel, or slightly above the loaded water line. Here are installed: Two General Electric 125 K.W. gear drive turbo-generating sets; one General Electric 50 K.W. geared drive turbo generating set for emergency and pier use with 200 lbs. saturated steam; two General Electric motor-generator sets; and the main switchboard for power and light circuit control.

All the electric wiring, electric outlets, fixtures, motor controls and lights are installed not only in accordance with the rules of the U. S. Bureau of Marine Inspection and Navigation, but also in accordance with the specifications of the Standard Oil Company of California, which are in much of this work more stringent than the rules of the Bureau.

The auxiliary turbines are served by a condenser, an air ejector, a circulating pump, and a condensate pump, all G. E. motor driven and all of Worthington design and manufacture.

On the starboard side of the engine room, on the same level as the generator flat, is located the ship's machine shop. The equipment here includes: a Rahn Larmon engine lathe; a Sibley drill press; a Steptoe shaper; a Hisey Wolf floor type grinder; a work bench; and an ample supply of machinist's small tools. This vessel carries a machinist, and he certainly ought to have a good time in this well equipped shop. Ample supply of compressed air is insured by a Worthington motor drive air compressor, a Westinghouse Air Brake steam driven air compressor, and a compressed air tank.

The consensus of opinion by the marine experts who inspected her is that "the W. H. Berg is a very fine job, complete in all details, and capable of performing creditably any duty within her capacity."

Engineering and deck officers and guarantee engineers all state that her performance was perfect on the long trip through the canal from Philadelphia. "Fourteen knots was made at times on the way up the Pacific Coast."

1938 Lifeboat Winch

(Continued from page 76)

One notable advantage of the A-E-CO Life Boat Winch is the compact design which saves deck space. The drums of the winch are mounted in tandem, one slightly below the other.

Another advantage of first importance is that the lowering speed by gravity is controlled by a lowering friction brake, which operates automatically. The winch can be stopped without jerks on the line.

The winch consists of two drums of equal diameter driven by two separate gears through a common pinion. Both drums turn in the same direction and at the same speed. Al gearing is of the spur type with ma chine cut teeth running in a bath of oil.

The Type E Winch is fitted with 5 H.P. motor for lifting a load o 6500 pounds at the hook at 15 fee per minute, through a three part pu chase. The motor is mounted on th top of the machine and the moto shaft is fitted with a clutch on th pinion to disengage when lowerin by gravity. This clutch is only e gaged when hoisting by power.

The first intermediate shaft is e tended at both ends for hand oper tion. The shaft is fitted with a fr wheeling brake band so that, wh hoisting by either motor or hand, t brake may remain set for holding.

The automatic lowering govern is also mounted on this shaft. T governor holds the lowering spe of the boat to about 27 feet per mi ute for a load of or under 12,000 l

The Type H and Type P winch are of the same design and constr tion as above. In Type H, howev motor and motor gearing are om ted. Type P has a clutched dr mounted above the crank shaft use with a power winch on deck. T drum is always stowed with a li cable.

Pacific Paint & Varnish Co.

Synthex Red Lead Primer (Q. D.)
" Anti-Corrosive
" Anti-Fouling
" White Enamel-Non-Bilge (O.S. & I.S.)
" Cabin Enamels (Q. D.)
" Mast Colors, Hull Black
" Boottopping, etc.

Synthex Marine Spar Varnishes and Yacht White Enamel

Aluminum Enamel

Flat White (Inside & Outside)

A specialized finish for each paintable surface.

Pacific Marine Finishes have been used successfully for years by most of the important steamship companies. Each represents a specially developed product for a specific purpose. Quality—not price—is the objective of our Research Department.

L. M. DuCOMMUN
President

San Francisco and Berkeley

A. B. ROBERTSON
Vice President

SWAYNE & HOYT, Ltd.

SHIPOWNERS and AGENTS
215 Market Street - San Francisco, California, U.S.A.

GULF PACIFIC LINE
(Between Gulf Ports and Pacific Coast)

CALMAR LINE
(Between North Atlantic and Pacific Coast)

YAMASHITA LINE
(Far East—New York—South America)

OFFICES:
Seattle - Portland - San Francisco - Oakland - Los Angeles - Chicago - St. Louis - Cincinnati - New York
New Orleans - Mobile - Birmingham - Houston

STOP Slipping as well as leaks on boat decks . . . through installation of

Case Weather Deck Covering

AN UNDER LAYER AND A NON-SLIP WEARING SURFACE

L.S. CASE CO.

INSTALLATIONS SINCE 1926 WITH LARGE FLEET OWNERS

L. S. CASE COMPANY

Applicators and Distributors
SAN FRANCISCO

7th and Daggett Streets

Phone: HEmlock 7821

BABCOCK & WILCOX BOILERS

Extra Values to Ship Owners and Builders

In DESIGN
Marine Boilers for Marine Service

In TRIAL RUNS
Experience Frequently Saves Money

In CONTINUOUS SERVICE
Regular Visits of B & W Service Men

The BABCOCK & WILCOX COMPANY, New York

Pacific Coast Offices:
450 Mission Street - San Francisco
Seattle
Portland
Los Angeles

Radiobeacon Errors

(Continued from Page 68)

and water boundaries a number of times and in some cases skirted the shore line for considerable distances.

Errors due to night effect probably affect direction-finder bearings taken by either method, but since these errors are probably influenced by the type of transmitting antenna, and since ship's radiotelegraph antennas may not generally have characteristics best suited for direction-finder work, the relative likelihood of serious error from this cause may be less if the observed signal is transmitted from a radiobeacon station with specially designed antenna. On the other hand, it is important to recognize that the most successful and reliable use of the direction-finder on board ship involves problems of installation and of calibration which cannot be safely ignored and which require frequent check-up by qualified personnel.

A further source of error with the shipboard installation which is less likely to be incurred with the shore installation is the possibility of error in converting the bearing to true bearing when using a magnetic compass, and resulting from either compass error or lag. This error largely disappears when the gyrocompass with repeater directly connected with the radio direction-finder is available. Some navigators have also found that this source of error can be minimized by using three bearings and plotting them with the three-arm protractor in suitable localities.

Collisions with Lightships

A recent survey of the records of the Lighthouse Service with respect to instances where lightships on station have been collided with by other vessels shows that there have been 88 such cases during the past 25 years, only a few of which have been serious. Of these 88 cases full information is available with respect to 73 only and of these it is interesting to note that 42, or about 60 per cent, occurred in clear weather. Insofar as the records disclose, no instance is chargeable to the failure of lightship signals. A further point of interest is the fact that 34 of the collisions occurred in daytime and 39 at night, 11 of the collisions in daytime having occurred in clear weather.

The greatest number of collisions have occurred in the case of the vessel on Overfalls Lightship station, where there have been 9 such instances in this period, 4 of them being in clear weather. Next in order in the number of collisions are the Pollock Rip station and Cornfield Point station, each of which have been collided with on six different occasions. Only four collisions have been reported in this period on the Pacific Coast, leaving that area with a comparatively clear record.

While the Service has undoubtedly been fortunate in escaping serious results except in a few cases, the experience herein outlined is sufficient to emphasize the importance of caution in navigating in the vicinity of lightships, to which attention of mariners has been repeatedly invited in special notices published by the Lighthouse Service. The number of instances which have occurred in clear weather show the danger of passing needlessly close to lightships regardless of weather conditions prevailing at the time.

S.S. LURLINE · S.S. MARIPOSA · S.S. MONTEREY · S.S. MATSONIA

Out in the tranquil Pacific . . in America's famous island pleasure-spot, smart gaiety is at its height among a cosmopolitan throng finding new ways to play, new secrets of happiness. Summer seas . . . sailed by luxurious Matson liners every few days from California . . . call you to Hawaii!

Royal Hawaiian and Moana hotel reservations at Waikiki are made when booking steamer passage. A distinct convenience to Matson Travelers.

Fares: California to Honolulu (each way)
FIRST CLASS from $125
CABIN CLASS from . . . $85

MATSON SOUTH PACIFIC CRUISES. *Personally-escorted* to New Zealand and Australia every four weeks. Over 17,000 miles via Hawaii, Samoa and Fiji; 48 days; 12 delightful shore excursions. All-inclusive-cost, complete cruise, First Class, from $775.

SHIPPERS: *Steamers Lurline, Mariposa, Monterey, Matsonia* provide swift freight service to Hawaii, with modern refrigeration facilities. The *Mariposa* and *Monterey* continue southward to New Zealand and Australia via Samoa and Fiji. Also regular and frequent freighter service from Pacific Coast ports.

Details from Travel Agent or:

MATSON LINE-OCEANIC LINE
San Francisco · Los Angeles · Seattle
San Diego · Portland

PACIFIC MARINE REVIEW

MARCH 1938

American-Hawaiian's M.S. Californian in the Canal

"WHAT EXQUISITE JEWELRY"—*your wife would say*

Only a glance is needed to know the exquisite quality and fine craftsmanship of jewelry like this. Its every gleam reflects the value that so obviously attached to it.

This same thing holds true of many products used in the Marine field. Often times a superficial examination is sufficient to reveal their quality or lack of it. But when it comes to the selection of rope, little can be told by an examination of this kind. Seeing and feeling a rope product will not tell you its strength or stamina, its ability to stand up under rough usage.

Marine rope buyers have found that it does not pay to take chances. They prefer to place their confidence in a product that has **proven** its dependability under the most exacting conditions of port and sea.

That is why, on the Pacific, the overwhelming choice is TUBBS SUPERCORE and TUBBS EXTRA SUPERIOR MANILA — true Marine ropes that for 82 years have proved their leadership and **extra value.**

TUBBS
ROPE

TUBBS *Cordage Company*
200 BUSH STREET, SAN FRANCISCO

PACIFIC MARINE REVIEW

ARCH 1938
OL. XXXV NO. 3

CONTENTS

Editorial Comment:
A Suggestion to the U. S. Maritime Commission. ... 17

"Let's Start Rebuilding Our Merchant Marine in 1938" ... 18

Pacific American Merchant Marine Labor Problems ... 20
By Almon E. Roth.
Responsible Performance of Contractural Obligations is the Only Solution.

Your Problems Answered ... 26
By "The Chief".

For American Deck Officers ... 29
Salvage Work in Strandings.

Junior Mariners ... 30

Pacific Coast Wire Drag Surveys in 1937 ... 32
By I. E. Rittenburg.

Some Shipwrecks I Have Seen ... 34
By Capt. Christen Julius Klitgaard.

Modern Treatment of Marine Boiler Feed Water ... 36
By M. C. Wright.

Ship to Shore Radio Telephone Service ... 37

Weather Atlas of the World ... 38

On the Ways:
Latest News from American Shipyards ... 42
Building in American Yards ... 44

Miscellaneous:
Engineers' Licenses, 28; Deck Officers' Licenses, 29; Monthly Review of Tanker Markets, by Oscar J. Beyfuss, 31; An Excellent Idea, 33; Bethlehem Launches a Destroyer, 35; Nickel in Modern Cast Irons, 40; The Dividends of Safety, by Byron O. Pickard, 40; Change of Masters, 41; Welded Steel Fishboat Hulls, 58; Literature of the Industry, 60.

Our Frontispiece

Our frontispiece this month is taken from the famous Coulter mural "Arrived all Well" in the San Francisco Marine Exchange, and depicts the sailing ship W. F. Babcock arriving inside the Golden Gate after one of her many passages around the Horn in the eighties and nineties of last century.

This vessel, a three skysail-yard ship, was built by the famous Sewall yard at Bath, Maine, in 1882. She was 240.8 feet long, 43.8 feet beam, 28 feet depth, and registered 2028 tons. She was owned and operated by her builders for 25 years, and during that time made 20 voyages from North Atlantic ports, 13 of which were to San Francisco.

At the time of this picture Dearborn & Co. (predecessors of the American-Hawaiian Steamship Company) were New York agents for the Sewall ships, and Williams, Dimond & Co., San Francisco, were agents in California.

Ship W. F. Babcock was operated in the intercoastal run until 1907, when she was sold to Charles R. Bishop, who in 1913 sold her to New York parties, who converted her into a barge.

(Picture reproduced through the courtesy of Abe Marks, manager Marine Department, San Francisco Chamber of Commerce.)

UBLISHED AT 500 SANSOME STREET . . . . SAN FRANCISCO

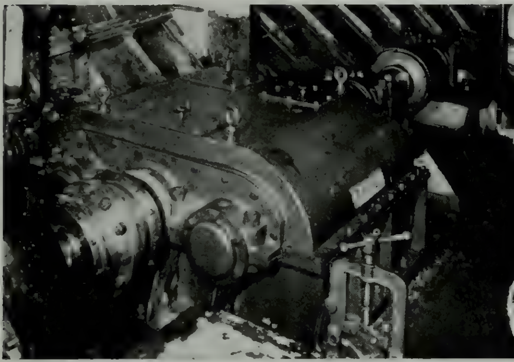
ntered as second class matter June 20, 1913, at the post office, San Francisco, under the Act of March 3, 1879. Published on the 1st of each onth. Advertising and editorial forms close on the 15th. Subscription price, one year: Domestic, $1.50; foreign, $2.50; two years: Domestic, 2.50; foreign, $4.00; three years: Domestic, $3.00; foreign, $5.50; single copies, 25c. Chas. F. A. Mann, Northwest Representative, 1110 uget Sound Bank Bldg., Tacoma, Washington. New York Office, Suite 404-405-406, Two Hundred Broadway, Telephone COrdlandt 7-3579

n New York City copies of Pacific Marine Review can be purchased at the news stands of I. Goldberg, 42 Broadway; Jacob Fuchs, 17 Battery Place; Philip Mandara, Greenwich Street and Battery Place at 25c per copy

J. S. Hines	B. N. DeRochie	Alexander J. Dickie	Paul Faulkner	F. Dryden Moore
resident and Publisher	Assistant Publisher	Editor	Advertising Manager	Assistant Editor

1ST IN A SERIES OF FARREL FACTS ON REDUCTION GEAR DRIVES

Tug "SYOSSET" Modernized with Diesel Gear Drive Installation



LEFT: *The Farrel Duplex Straight Line Reduction Gear installation in the "Syosset" — transmits 540 H.P. at 300 R.P.M.—connects engine and propeller shafts on same center line—all bearings roller type—thrust bearing built in.*

BELOW: *The tug "Syosset", equipped with a Farrel Duplex Drive, Gearflex Coupling and Torque Shaft.*

FARREL GEARS

PUT NEW LIFE IN 40 YEAR OLD TUG

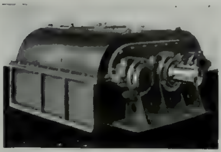
The converting of the steam tug "Syosset" to an efficient Diesel powered vessel is an example of what can be done to scores of similar ships.

The owners knew that the "Syosset's" splendid towing record was the result of the slow propeller speed of the steam engine, and that they could not get the highest overall efficiency from the Diesel engine **unless** the slow wheel speed could be retained.

A 540 H.P. Superior Diesel, turning at 300 R.P.M., and a Farrel Reduction Gear of 3:1 ratio were finally selected for the work. This made possible a propeller speed no greater than with the steam plant, it reduced the space required for main and auxiliary engines and eliminated tons of needless machinery weight. Over four years of nearly continuous operation have proven that the modernized "Syosset" is one of the ablest tugs in the service.

The "Syosset" is little different from hundreds of other tugs that were admittedly efficient vessels in the days when they were built. They can again be economical, profitable vessels—by installing modern Diesel Gear Drive.

STRAIGHT LINE DRIVE



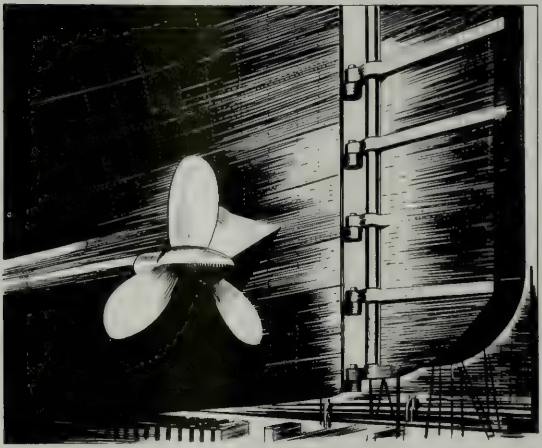
Shown at the left is a Farrel Duplex, Straight Line Reduction Gear of the type installed in the "Syosset." These drives are available in a wide range of sizes from 200 to 5,000 H.P. and with any ratio from 1:1 to 24:1.

CONSULT YOUR NAVAL ARCHITECT

who can give you information on the advantages of slow-turning propellers, whether for a tug, a fishing vessel, a ferry, passenger ship, freighter or yacht. If you want detailed recommendations on the installation of a Farrel Reduction Gear our engineers will submit a proposal. They will be glad to work with you in making your vessels more efficient and profitable to operate.

FARREL MARINE EQUIPMENT includes reduction gears of the vertical offset, horizontal offset and straight line duplex types; Gearflex couplings, thrust bearings, torque shafts, tail shafting and couplings for any size marine installation.

FARREL-BIRMINGHAM COMPANY, INC.
392 Vulcan St., Buffalo, N. Y.
New York: 79 Wall St. Los Angeles: 2032 Santa Fe Ave.



IS SEA WATER DESTROYING YOUR STERN TUBE BEARINGS?

It's time to end the damage from salt water and sand to tail shafts and tail shaft bearings . . . whether Lignum-Vitae or white metal

Since the first engine-powered ship slid down the ways, sea water has always been troublesome to stern tube bearings.

The damaging effect of salt water, sand and grit has cost ship owners millions of dollars.

Shell engineers, after years of work, now offer a practical method of stern tube lubrication with grease.

Over 140 ships on the Pacific Coast have adopted this new method of stern tube lubrication. It has proven its worth under all operating conditions, on vessels of all types, and for satisfactory periods of time.

Shell's Marine Engineers would like to tell you about this new development. Get in touch with your nearest Shell office, or write to: Industrial Lubricants Division, Shell Oil Company, Shell Building, San Francisco, California.

SHELL

SHELL MARINE LUBRICANTS

S

PACIFIC MARINE REVIEW

VOLUME XXXV MARCH 1938 NUMBER 3

A Suggestion to The U.S. Maritime Commission

The best way to get practical information is through practical experience.

At the present time the U. S. Maritime Commission, having received a mess of very high bids on its C-2 cargo vessel design, is flirting with the idea that it had better have these ships built in Europe.

Now we know that no ship exactly similar to this design has ever been built anywhere. Certainly none has been built in a commercial European shipyard.

We would like, therefore, to make a very simple suggestion concerning the matter of building these vessels.

While the Congress and the President are wondering just what plan should be followed, why not build a ship or two and find out just what they do cost?

Four of the yards that bid on these ships are now without work. Why not build a ship in each of these yards and find out just what these vessels will cost? The present subsidy law prohibits the shipbuilder making more than 10 per cent profit. It also prohibits the Commission from subsidizing any building in foreign yards.

There are two bidders on the Atlantic Coast (Hess and Tampa), and two bidders on the Pacific Coast (General Engineering and Bethlehem), whose shipbuilding ways are practically empty.

Give each of these yards that is ready to take it one C-2 standard design cargo vessel. Under the inspection of the Commission let them build that vessel. Hold them rigidly to specifications but not to any guarantee of speed of ship or economy of machinery. Then give these ships a thorough test and modify plans and specifications as the results indicate.

By this method the Commission would accomplish a number of very desirable objectives:

(1) American costs for such tonnage built to such specifications would be definitely established;

(2) Pacific Coast differentials would be more clearly defined;

(3) The designs and estimates of the technical staff of the Maritime Commission would be tested and that staff would have a mass of reliable up to date cost and performance data on which to base future work;

(4) Many mechanics and laborers would be given employment immediately.

We predict that if such a procedure is adopted, the U. S. Maritime Commission will find these ships costing substantially less than the average bids.

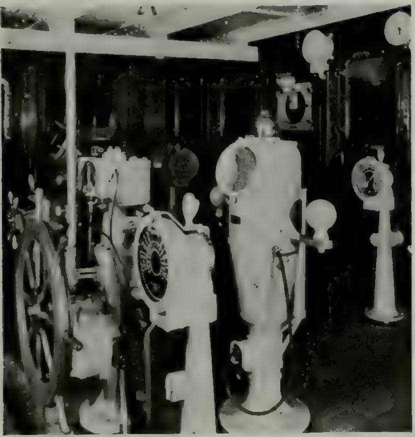
On another page in this issue we have indicated that we do not approve of the C-2 design as a commercial cargo carrier. That is only one opinion based on knowledge of other cargo carriers. We would like to see the design tried out both as a shipbuilding and as an operating vehicle.

At any rate, and even at the expense of building some experiments, we would very much like to see our shipbuilding plants on both coasts kept busy.

"Let's Start Rebuilding Our Merchant Marine in 1938"

"Let's Start

Our



I. *Some Comments on the Building Program Proposea by the Maritime Commission*

(Continued from January Issue)

Our January installment of the series under this title closed with an analysis of the U. S. Maritime Commission's proposed design for a standard cargo vessel, and some suggestions for changes in the details and arrangements of the hull.

Since that time bids have been opened on plans and specifications covering this design. These bids ranged from $1,800,000 to $3,500,000 in round numbers. Two average bids, one from an Atlantic Coast yard and one from a Pacific Coast yard, were practically the same at approximately $2,800,000. This is, of course, very high for a cargo vessel supposedly designed to be a standard ship, ideal for low cost construction.

The Maritime Commission, in releasing the figures on these bids, indicated once more its opinion that American shipbuilders were showing "damned effrontery" and other evil traits in naming any such figures for the building cost of these ships. In this connection it will be remembered that the Maritime Commission had much the same experience with the plans and specifications (as first issued) for the United States liner designed to run alongside the Manhattan and the Washington. The Commission declared to the press that the bids were way out of line, and that the ship would be built in a navy yard to show the American commercial shipbuilder he could not put anything over on the Commission. However, the navy yard estimates on this ship proved to be higher than the firm bids of the shipbuilders. So after some redesigning the job came to a private yard.

Now it is time to ask why designs and specifications issued by the Maritime Commission should bring in such high bids from American shipyards. It is very apparent to anyone who knows the present American shipbuilding situation that the yards still have ample room for new work. Commercial tankers are being built for American oil companies by American yards on duplicate orders at prices per total deadweight ton capacity that are very much lower than the average bids on these cargo vessels. In commercial shipbuilding practice it is normal for cargo carriers to cost at least 10 per cent less per deadweight ton than tankers.

Let us apply a little rough analysis to the standard C-2 design at the average bid of $2,800,000.

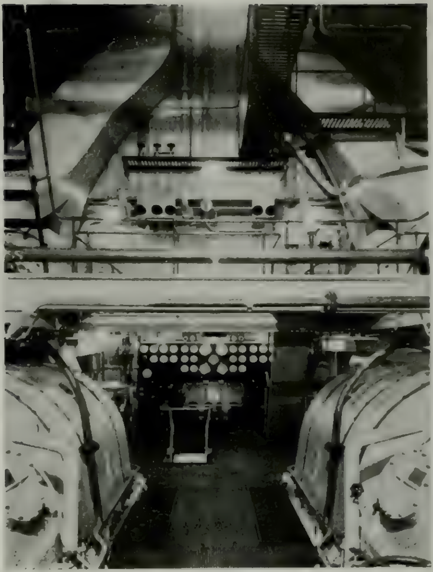
First. Deadweight Tonnage: The C-2 design, on dimensions of length B.P., 435 feet; beam molded, 63 feet; and depth at side, 40 feet 6 inches; has a full load draft of only 25 feet 9 inches. On this draft she has a displacement of 13,812 tons. Her hull and machinery weigh 5,133 tons, and so she has a total deadweight capacity of 8,679 tons. Her fuel tanks and water tanks content filled to capacity plus her stores will weigh 1,530 tons, and so her cargo capacity is whittled down to 7,149 tons.

This figure seems small for such a large ship. The limitation of deadweight at this figure apparently does not come from lack of room. The cubic capacity of the cargo spaces figures 77 cubic feet to each of these 7,149 tons. But ordinary cargo averages have indicated the advisability of setting the measurement ton at 40 cubic feet. That means the wise shipowner, if possible, charges on a measurement tonnage basis for all cargoes light enough to measure more than 40 cubic feet to the ton. Since the bale capacity of this ship is 550,000 cubic feet it is easy to figure that she will hold 13,750 measurement tons of cargo.

That is a good husky volume capacity, but if an owner operating this ship had to take on a full cargo of goods measuring 40 cubic feet to the ton or less he would be down to his allowable draft when his ship was not much more than half full. However, this can very easily be remedied in the design by bringing all the watertight bulkheads up to the shelter deck, thereby making a deeper draft allowable. On 30 foot draft this vessel would have approximately 3,000 tons more displacement than the present design allows.

Second. Machinery: As suggested in our article in the January issue, the propeller speed of 80 r.p.m. is much lower than is necessary for good propeller design, particularly when it calls for a wheel over 20 feet in diameter to absorb 6,000 horsepower. One hundred and twenty revolutions on the propeller would allow a wheel four to five feet less in diameter and much more efficient on account of the depth of water over the blades. That speed would also

Rebuilding Merchant Marine in 1938"



allow a smaller line shaft, lower structural foundations under the pillow blocks, smaller and lighter gearing. All of this will cut down weights by about 50 tons and reduce costs of hull construction and cost of machinery in way of these items.

Three. Cargo Handling: We are told that each pair of king posts on these ships is to be fitted with a boom for heavy lifts. The usual commercial practice is one such boom to the ship.

Four. Costly Trial Trips: We are informed that the specifications on which these bids were submitted call for each ship being put through practically navy standard sea trials for speed, economy, endurance, etc. These tests must be conducted with the ship in commercial loaded condition. Guaranteed performances are called for, with heavy penalties for any failure to come up to guarantee. These penalties are assessed, for instance, on each 0.01 of a lb. of fuel per brake horsepower hour over the guarantee. This is U.S. Navy tactics. A design is made by U.S. Commission experts. These experts pick the machinery, specify the power, and ask the shipbuilder to guarantee results. The old established yards who have had most experience with U.S. Navy methods naturally begin to get suspicious and add liberal amounts to their estimates to take care of unforeseen differences and difficulties that may come up later. Since they are limited to a 10 per cent profit over bare cost their bids might better err on the high side than the low. The sea trials of these ships will be quite expensive.

Five. Costly Bonds: The contractors on these bids are asked to put up very heavy bonds for performance of contract. This again brings U.S. Navy contracting practique into the commercial shipbuilding picture and the bids go up.

Summing up all of these factors, we find from (1) and (2) above that these ships, judged from the commercial viewpoint, should be considered as having a total deadweight capacity from 11,500 to 12,000 tons. This consideration immediately lowers the cost per deadweight ton very considerably. On the $2,800,000 bid the unit deadweight ton cost is here reduced from approximately $325 per deadweight ton to $233 a deadweight ton.

This is still much too high for commercial ships and is more than double what a commercial cargo carrier of similar capacity would cost in European shipyards.

By a careful check on the items suggested by factors (3), (4), (5) above, and by elimination of the costs not usually present in commercial shipbuilding practice, we believe it would be possible to get bids from most of the American shipyards at figures under $200 a deadweight ton.

We also believe that for purely commercial purposes a cargo carrier, with a deadweight cargo capacity of 7,200 tons, could be designed on a loaded displacement of 11,500, and attain a sea speed of 15 knots with less than 5,000 horsepower.

The C-2 standard design is not based on the latest findings in the science of naval architecture. As a standard it is at least 10 years back of the forefront of progress. Our competitors all over the world are building ships—new, up to the minute ships. Great Britain alone launched a seagoing merchant vessel for practically every working day of the last twelve months. Why! Surely not because she needs more tonnage. And not because her fleet averages over 20 years of age. No. Many of these new vessels are being built to replace vessels 10 to 15 years old that have become obsolete.

One British builder of cargo vessels delivered 37 motorships in 1937. Most of these were to owners who in 1924 and subsequently had bought from this builder his then "economy cargo vessel," a motorship guaranteed to make 9½ knots with 9,000 tons of cargo in the holds on a fuel consumption of nine tons a day. In 1935 this builder brought out a super economy motorship which was guaranteed for practically the same performance on six tons a day. That is progress, and that builder has cashed in heavily on his progressive methods.

Now this is not a plea for diesel motorships. The progress referred to in the last paragraph was not due to a diesel engine but to improvements in design of hull and engine which

(Page 60, Please)

Pacific American Merchant Marine

By Almon E. Roth

President, Waterfront Employers Association of the Pacific Coast

A number of factors have combined recently to make the people of the United States, and particularly those of the Pacific Coast, merchant marine conscious. Among these may be noted the disastrous waterfront strikes of 1934 and 1936, and more recently, the survey and report by the Maritime Commission under the chairmanship of Joseph P. Kennedy. This survey and report by the Maritime Commission was without question one of the most thorough and comprehensive that has ever been undertaken by any branch of our Federal Government.

The report of the Maritime Commission has been most helpful in directing the attention of the entire country to the need for a modern and effective merchant marine, and to the importance of stable labor conditions in our industry.

● Remedial Proposals.

As a remedy for unsatisfactory labor conditions in the maritime industry, the Commission makes certain definite proposals which I shall attempt to analyze in the light of our own Pacific Coast experience. One of the first tasks which the Commission undertook was the establishment of minimum wages and manning scales. Inasmuch as the wages paid on Pacific Coast ships are in practically every instance equivalent to those fixed by the Commission, and in some instances higher, it is fair to assume that our maritime labor difficulties on the Pacific Coast are not caused by low wages. As a matter of fact, our basic wages, taken over the entire industry, are the highest in the world. The average earnings for longshoremen on the San Francisco waterfront during the year 1937 were $208 per month. A recent study by the National Industrial Conference Board shows that the average earnings of employees for 25 manufacturing industries for the year 1936 was $112.00 per month.

A comparison of wages paid American seamen with wages paid on English and Japanese ships of two of our principal competitors is very illuminating. Able bodied seamen on American offshore vessels receive a basic wage of $72.50 per month and found. English seamen in the same class, $40.00; Japanese seamen in the same class, $16.00 per month. These figures do not take into account overtime, which is a very considerable item on the American lines. At the present time some of our Pacific Coast companies are paying as high as 20 per cent of their payroll for overtime. One of the principal causes of maritime disputes is that of claims for overtime.

● Overtime Difficulties.

Our overtime difficulties arise principally from the fact that each union has attempted to define in the most minute detail the duties to be performed by its craft. Overtime is claimed in most cases because the work performed does not fall within certain prescribed duties rather than because the work is performed outside the regular hours of duty. It sometimes happens there are duties to be performed on a vessel which no member of the crew will perform without payment of overtime. To illustrate: On one of our Pacific Coast liners it occasionally is necessary to turn a valve on the evaporating machines. Since this duty had not been definitely assigned to either the engineers, the oilers, the watertenders or wipers as a part of their regular duty, no employee in any of these classifications would perform this service, which requires some five minutes, without the payment of one hour overtime. Carpenters on some of our Pacific Coast vessels are demanding overtime for the construction of bulkheads, even though the work is performed during regular hours. When the owners protested this demand and asked why a carpenter should be paid overtime for a job which is so obviously a carpenter's function, the frank answer of the union delegate was that the carpenter got less overtime than anyone on the vessel, and this was about the only item they could find on which to base a claim for overtime.

Concerning the troublesome item of overtime, the Commission, in its supplemental report, has the following to say:

"The Commission has adopted no regulation defining overtime work and the pay therefor. It has come to the attention of the Commission that serious abuses exist in the industry with respect to overtime, particularly at sea. It has been charged that the crews of many vessels are deliberately loitering during their regularly assigned hours of work in order to create a necessity for overtime. The Commission has accordingly directed that an extensive in

Labor Problems

Responsible Performance of Contractural Obligations is the Only Solution

estigation of the whole overtime roblem be made with the object of iscovering a solution which will dequately protect seamen against ng hours and at the same time liminate the evils of unjustifiable laims for overtime."

We who are struggling with this exatious problem will await the uggested solution with great interest.

Since government subsidies are ased in part upon the differential etween the wages paid on American essels and on foreign vessels, the nthinking layman may ask why the hipowners are so concerned over he matter of wages and overtime. he answer is found in the fact that nly 31 out of a total of 229 ships in ur Pacific Coast fleet receive any ubsidy from the government. Our ontracts with the union make no istinction between non-subsidized hips and subsidized ships. Increased wages and claims for overtime on he 198 ships which are not subsidized cannot be passed on to a beneicent government. This unsubsidized section of our merchant marine must continue to compete with foreign vessels which pay a much lower cale. Our intercoastal and coastwise hips are in competition with rail oads and truck and bus services. It s significant and disturbing to note hat all coastwise passenger service n this Coast has been discontinued nd that coastwise trade particularly has suffered greatly in recent ears from loss of tonnage through ompetition with other forms of ransport. At the present time 45 team schooners out of a total of 92 which normally operate on this Coast are tied up in our harbors. In addition, 32 offshore vessels are tied up on this Coast for lack of cargoes. A total of 3850 seagoing employees have been deprived of their employment by the tie-up of these vessels. The point which I am seeking to make is that there is a limit to the wages and the operating costs which the unsubsidized portion of the American merchant marine can pay, and the tie-up of 92 ships should be sufficient evidence that we have gone beyond the limit.

Shall our ships be tied up or profitably employed? Labor has the answer.

● Crews' Quarters.

Another factor which the Commission stresses as contributing to unsatisfactory labor conditions in our merchant marine, is that of crews' quarters. Personally I believe that this is the most justifiable complaint which the seamen have made. There is no question but that the quarters on many vessels are crowded and that a number of our ships lack sufficient space for proper mess rooms, recreation rooms and hospital facilities. I am sure that all of our Pacific Coast shipowners will agree with me when I say that it would be good business for every shipowner to provide the best possible quarters for his crew. Unfortunately, however, there are limitations upon what can be accomplished in this regard.

With respect to new ship construction, there is every likelihood that the new ships to be built in this country will provide quarters which are superior to anything now provided for seamen in any country. The problem of improving quarters in old vessels is not so simple.

With regard to quarters on old vessels, the Commission has the following to say:

"The problem of improving existing vessels is more complex. Many of the ships are so constructed as to render any considerable enlargement of the crews' quarters physically impossible. The greater part of the American Merchant Marine fleet is over eighteen years of age and has a limited useful life expectancy. Large expenditures for improvement of such ships is economically precluded."

In spite of these limitations Pacific Coast shipowners in recent years have spent very large sums for the improvements of ships' quarters on old vessels.

Evidence given in the Maritime Commission hearings shows that four lines on the Pacific Coast spent in excess of $250,000 on improvements to quarters during the past year. One union official testified that the Pacific Coast operators "had done everything humanly possible to improve the quarters on the old ships which are now in service on this Coast." It is interesting to note that no matter what the conditions may have been in years gone by, the American seaman today is receiving ample quantities of good food. The testimony at the Pacific Coast Maritime Commission's hearing by the seamen themselves was uniformly to this effect. The only exception was one witness who stated that occasionally the food was poor, not because of failure of the company to furnish good food, but because "the cook was a bum."

Another difficulty which leads to the tie-up of vessels is the troublesome problem of distributing the quarters on the vessels to the various crafts employed thereon in accordance with their individual desires. For the past two weeks we have had a vessel tied up in the port of San Francisco over a dispute involving quarters. In this case the owner, at the demand of the men and in order to keep his vessel in service, rebuilt the quarters for the firemen in accordance with the plans submitted by the firemen's delegate. When the work was finished it was not satisfactory to the delegate and the vessel was tied up by the Firemen's Union with a demand for radical changes necessitating complete reconstruction of the unlicensed personnel's quarters. A second plan was prepared and agreed to with the understanding that these changes would be made upon the return of the vessel to San Francisco from New York. In the meantime, vessels of this type were inspected by a committee of experts of the Maritime Commission and definite plans and specifications for remodeling were laid down. It proved impossible to make the changes which had been agreed to previously with the men and still conform to the Commission's recommendations. To have made the changes would have necessitated the shifting of quarters for other members of the crew in violation of the Commission's recommendations that no additional unlicensed personnel be housed in that portion of the vessel which is reserved for licensed officers. This will give you a faint idea of some of the problems arising out of the matter of crews' quarters.

Signing for the Voyage.

A further suggestion which the Commission has made as a solution for labor difficulties, which is highly to be desired, but is difficult to accomplish, is that shipping abandon its archaic custom of signing men on articles for one voyage only and extend the term of the seamen's employment. Everyone will agree that continuity of employment is greatly to be desired in the shipping industry, as in any industry, but we have found there are certain fundamental difficulties in attaining it. First is the fact that at least among the unlicensed personnel it is traditional for men to change their ships in order to make different voyages and visit different countries. "Join the Navy and See the World" is a familiar slogan. It is of course apparent that one cannot see the whole world while working continuously on a run from Seattle to San Pedro and back. If seamen are to see the world they must not only change ships, but change their companies because the companies generally confine their operations to regular scheduled routes.

But a far greater obstacle to increased continuity of service is the fact that the union membership on the Pacific Coast is far in excess of the number of men needed to man our vessels except at peak periods. At the present time the number of sea-going personnel required to man the combined fleets of the Pacific American Shipowners Association, consisting of 229 ships, is approximately 16,300. The total membership of the marine unions of the Pacific Coast is 23,300. We therefore find that the membership in our unions exceeds our normal requirements by 7000 men. If we add to this number the 3850 men now laid off because 77 of these vessels are tied up, we find that at the present time 10,850 seamen, or almost 50 per cent of the union membership, are without employment and "on the beach," as we say on the waterfront. Even under normal conditions approximately one-third of the membership of the maritime unions cannot be employed.

As a result of this situation the unions find it necessary to rotate employment whenever it is possible. Men who pay union dues naturally demand jobs through the union operated hiring halls. If all jobs were rotated among the men on an equal basis, no man could possibly be employed for more than 50 per cent of the year under present conditions or 60 per cent of the time under normal conditions. Such a situation precludes continuity of employment As a matter of fact, one of the most recent labor disturbances which we have had on the Pacific Coast arose from an attempt on the part of the Alaskan lines to maintain continuity of employment and their objection to the displacement of their regular men by men who had had no experience in the Alaska trade.

In an effort to provide employment for unemployed seamen, many of the companies have attempted to use seamen for maintenance or repair work on vessels when they are tied up in the ports. Here again however, we have experienced difficulty by reason of the fact that the shore unions, such as scalers, machinists and mechanics, object to this work being performed by seamen One of the first waterfront beefs which I encountered upon taking my office as president of the Pacific American Shipowners Association arose out of a picket line which had been placed on one of our docks by the Scalers Union as a protes against the use of seamen for painting the ships while they were in port

Responsible Organization.

Another recommendation which the Commission makes, with which we find ourselves in hearty accord is the necessity for responsible organization on the part of both the employers and the employees in th maritime industry. Unfortunately however, organization alone is no the answer to our problem. If i were we would have had no labo difficulties on this Coast during th past two years, for the maritime industry on the Pacific Coast is probably the most highly organized from the standpoint of collective bargaining of all industries in the United States. In this respect the Pacifi Coast section of the American Merchant Marine is setting the pace fo American shipping, and in fact fo every American industry.

We have had collective bargainin in our industry since the Award o 1934. From a strictly legal standpoint our contracts are on a po basis. As a practical matter, how ever, all of our present contracts were negotiated on a coastwise basis for the entire industry. Our longshore contracts were negotiated and entered into by a shipowners' committee acting under delegated authority from all operators on this Coast, including both foreign and domestic trades and comprising more than 139 concerns. On the union side the contract was negotiated and executed by a Coast Committee on behalf of some 59 local unions.

In June of last year, a permanent organization was effected known as the Waterfront Employers Association of the Pacific Coast with a Board of Directors which has power on behalf of all lines operating on this Coast to enter into labor contracts with onshore unions and to represent the industry generally in its labor relations.

A similar organization, comprising the American-owned lines with their home ports on the Pacific Coast, has authority to represent these companies in negotiating and enforcing contracts with the offshore unions.

It is our opinion that the organization of the ship operators in such an association is greatly to the benefit of our employees as it promotes the establishment of long-time constructive labor policies and ensures uniform standards by all operators. Many labor leaders agree that it is greatly to the advantage of the unions to have the employers organized in order that they may deal with one responsible authority. As a matter of fact, it was the demand of the maritime unions themselves for standard coast agreements which induced the shipowners to set up these coastwise organizations of employers. Some of the radical publications which circulate on the waterfront would have you believe, however, that they were set up for the sole purpose of crushing unions.

Not only has the maritime industry of the Pacific Coast led in the matter of the organization of the parties to labor contracts, but it has also set the pace in the matter of the negotiation of written contracts. As an example of accomplishment in this field, the employers and the Longshoremen's Union have agreed upon uniform loads for some 63 standard commodities which govern operations on every ship in every port on this Coast. We have also agreed upon uniform penalties to be paid on some 39 separate items of offensive or dangerous cargo. The adoption of these standards has done much to eliminate many disputes and stoppages of work in local ports.

A Safety Code has also been agreed upon with the exception of one rule out of 108, which rule was not agreed to because it was involved in certain arbitration proceedings which had been held in various ports.

It is inevitable that disputes will arise over the interpretation or meaning of labor contracts in the same manner as they will arise over the interpretation of any contract. In order to meet this situation the maritime industry has provided for a local Labor Relations Committee at each port to hear and adjudicate these disputes and administer working rules.

Stoppages of Work.

I am sure that you will agree that we have made great progress with the mechanics of collective bargaining. I repeat that if organization and the execution of contracts were the only things needed to end labor troubles, then the Pacific Coast merchant marine should have no labor difficulties. But if you have been following the daily press you will know that we have not yet reached this millennium on the waterfront. Since January 1, 1937, we have experienced 168 stoppages of work on this Coast. Theoretically, it all looks very simple. We have reduced the matter of wages, hours and working conditions to written contracts. These contracts provide that there shall be no stoppages of work and that all disputes shall be referred to the Labor Relations Committee, and in the event there is disagreement, to an arbitrator. Had this contract provision been followed we could not possibly have had any quickie strikes or other stoppages of work.

The absurd feature of this situation is that in every instance where we have had a stoppage of work the parties have ended up doing exactly what they should have done in the first instance, that is, either have solved the matter through mutual agreement in the Labor Relations Committee, or through arbitration.

Organic Complications.

The structure of labor relations in the shipping industry is inherently complicated and difficult. More than 60 different crafts belonging to ten different unions are involved in the operation of a vessel, and the loading and unloading of its cargo. Each of these crafts has sharply defined duties and privileges and is jealous of its prerogatives. Some of them have been openly antagonistic to each other for many years. To illustrate: For more than 50 years the sailors and longshoremen of the Pacific Coast have engaged in a conflict which at times has resulted in riots and bloodshed over their respective rights to the work of loading and unloading steam schooners. In many cases these unions belong to different factions of labor and are therefore involved in the jurisdictional disputes between various national labor groups. At the present time the Masters, Mates and Pilots are affiliated with the American Federation of Labor. The longshoremen and several other unions are affiliated with the C.I.O.; and the sailors are independent of either national labor organization. However, this is not the whole picture. All of these different crafts must be fed, housed and hospitalized on the vessel. For the greater part of the year the vessel is their home and you can well imagine the difficulties of housing men of different races, and all of these varying classifications in the necessarily restricted quarters of the vessel for 24 hours of the day. It would be a most difficult problem to keep them happy and satisfied entirely aside from the union complications involved.

On the employer side the situation is complicated by the fact that the individual members of our shipping associations are keen rivals in a highly competitive field. You can readily imagine the inherent difficulties of securing cooperation in a common program by foreign lines, domestic lines, subsidized and unsubsidized lines.

Unions Distrust Arbitration.

A second difficulty has arisen out of the employees' lack of faith in mediation. Union labor looks upon the strike as its most effective weapon and naturally resents any process which interferes with the exercise of this weapon.

The employees frankly state that they do not believe that the men who are usually chosen as arbitrators have had the training and experience which makes it possible for them to understand the employees' point of view. It is their contention that no one except a man who has actually worked with his hands in the industry can ever appreciate their point of view; and that the arbitrators are not chosen from men who have had this experience. Furthermore, they contend that arbitrators generally are susceptible to the arguments of skillful attorneys, and that the men are at a disadvantage in this respect because they do not have the means to employ high priced legal talent. From what I have observed of their attorneys they need have no fear on this score, for they have proven most resourceful. It is this reluctance to submit disputes to mediation and arbitration which is in part responsible for stoppages of work in violation of our agreement.

● Jurisdictional Disputes.

Another factor which has upset our process of collective bargaining is that of jurisdictional disputes which are entirely beyond the control of the ship operators. The recent difficulties in Portland which threatened for a few days to result in a tie-up of operations in that port and the recent teamster embargo in San Francisco were of this nature. In Portland the difficulties arose from the fact that the Timber Workers Union had placed a picket line upon the Portland docks and that the longshoremen were refusing to go through the picket line and work the vessels. This tie-up was finally averted when the picket lines were withdrawn.

At Newport, one of the small ports in Oregon, these picket lines were continued, however, and the shipowners found it necessary to resort to the courts for relief. In a written opinion Judge Fee of the United States District Court ruled that the shipowners were entitled to an injunction to restrain interference with their commerce arising out of picket lines established by the third parties.

Since February 4, 1937, most of our labor difficulties on the Pacific Coast have arisen out of jurisdictional disputes between A.F. of L. and the C.I.O., which are completely beyond the control of the shipowners.

Our contracts covering longshore work were originally executed with an A.F. of L. unit, the International Longshoremen's Association. These contracts provided for the operation of hiring halls by the I.L.A. and for the settlement of disputes through a joint labor relations committee, consisting of representatives of the shipowners and of the I.L.A. This contract was automatically renewed on September 1st. In the meantime the majority of the men in the union have changed their affiliation to the International Longshoremen's and Warehousemen's Union, which is a C.I.O. unit. Shipowners have been served with notice by each of these unions that it claims the right to administer this contract and to represent the men. The shipowners have continued to operate under existing contracts and to deal with the employee representatives on the joint Labor Relations Committee who were elected before the controversy arose. Since our contracts have been renewed and are in operation, there is no occasion at the moment to do any collective bargaining. The real question at issue, therefore, is which of these two unions is entitled to perform certain functions under the existing contract. Each union is hopeful that the owners will take some position or commit some act which will aid it in its battle for the support of individual longshoremen. From a legal standpoint anything which we might do to favor either union could not possibly change or affect the legal right of either union in our existing contract. Any declaration on our part could only be useful for political purposes and would expose us to the charge of having taken sides in an inter-union dispute, in violation of the Wagner Act.

The owners positively refuse to give Mr. Bridges or anyone else a letter which can be used to crush the opposition. We have been told quite frankly that this is the purpose for which such a letter would be used. We are not going to do anything which can be used to the benefit or prejudice of either faction in this dispute. In the meantime we are walking a tight-rope in our efforts to maintain a neutral position. You can well imagine how delicate our position is under these circumstances. The question first arose in July of this year and it is still unsettled. We have no right under the Act to ask the National Labor Relations Board to settle the question, and for some reason best known to the unions, neither union has pressed its case before this Board. Petitions have been filed by the C.I.O. unit with the National Labor Relations Board, but the matter has been continued from week to week without any full hearings.

As a result of this situation, the shipowners have been accused of double dealing by both sides in the controversy and the result has been a mass of charges and countercharges, with resulting misunderstanding and confusion. At the present moment these matters are finally being litigated in the courts, and the sooner they are settled the better it will suit the shipowners. They should have been settled months ago. It is to our interest to have these jurisdictional disputes eliminated at the earliest possible date, and we naturally shall abide by any decision which any qualified tribunal may render.

It has been charged that the shipowners are engaging in disruptive practices in an endeavor to break up the unions. Nothing could be farther from the truth. Our principal concern is to be able to deal with responsible unions which are honest enough to deliver a fair day's work and strong enough to compel observance of the contract by their individual members.

Incidentally, the Waterfront Employers Association of the Pacific Coast is not using labor spies or engaging in labor espionage. Personally, entirely aside from the ethics of the situation, I consider their use futile. I cannot understand how anyone would put any confidence in a man who would betray his own union. The Congressional committee which has been looking into this subject has made some very broad statements. The employment of Pinkerton detectives does not always ran that employers are engaging in ufair practices. These detectives hve often been engaged to watch te docks to prevent pilferage, which hs grown to alarming proportions i Pacific Coast ports, particularly Sn Francisco. The losses in this prt due to deliberate destruction of pckages and theft have run into most unbelievable figures. Some ars the losses have exceeded $200,00. Surely an employer should be titled to engage detectives or atchmen to protect his property ithout imputations of unfair labor actices. While the Congressional mmittee is looking into this queson it might well examine into the atter of the use of spies by labor elf. Many prominent labor leaders the waterfront are constantly beg spied upon by opposing factions nd many of them are almost always companied by body guards. Rently my own office files were rifd.

Union Labor Leadership Personnel

Another factor which makes colctive bargaining difficult is the atter of the personal equation inolved in union leadership. A cerain number of leaders are elected pon platforms which call for troue with the shipowners. Too often, order to hold his job, a union fficial must obtain concessions rom the shipowners, and the most ffective way to obtain these conessions is to tie up ships. Leaders re apt to be chosen, not on the basis f their ability to avoid trouble, but n the basis of their ability to "bring ome the bacon," and in every case he shipowners are expected to proide the bacon in the form of allownces for overtime, reduced producion to create more jobs, and other orms of union benefits.

Largely, as a result of this program, production has been reduced o the point where the cost of handing cargo in this port is probably he highest in the world. As an illusration, a gang of longshoremen used o handle as high as 3,000 sacks of sugar per hour in the unloading oprations at Crockett. A few weeks go a check-up showed that we were getting only 950 sacks per hour per gang. Even if it be admitted for the sake of argument that 3,000 sacks is an unreasonable amount to expect from the men, I think it will need no argument to prove that 950 sacks is just as unreasonable an amount to deliver to the owner. Observation of this operation proved that the men in the hold were resting 60 per cent of their time; 2 000 sacks an hour would certainly not be an unreasonable production.

● Mutual Confidence Necessary To Success.

One of the first requirements for successful collective bargaining is mutual confidence and a will to make it succeed. Unfortunately, we are so close to the distressing experiences involved in our recent strikes that it has not been possible to overcome all of the distrust and class hatred which was engendered in these strikes. It would take several years under normal conditions for the heat of the strikes to subside. But, unfortunately, we are not faced with normal conditions. The members of the maritime unions have been subjected continuously to skillful propaganda which has for its primary purpose the creation of class hatred and the development of distrust.

I would not have you believe that all leaders of the maritime unions share this distrust and engage in a campaign of hate against the ship operators. On the contrary, there are leaders who have made an honest effort to cooperate in the development of a better relationship between the employer and the employee. But anyone who will take the time to read the publications which are circulated on the San Francisco waterfront will find ample evidence of the campaign of hate to which I refer. Even the jurisdictional disputes which have arisen in the various ports to the great detriment of shipping are invariably referred to by all of the parties as a shipowner's plot against the unions.

● Communistic Activities.

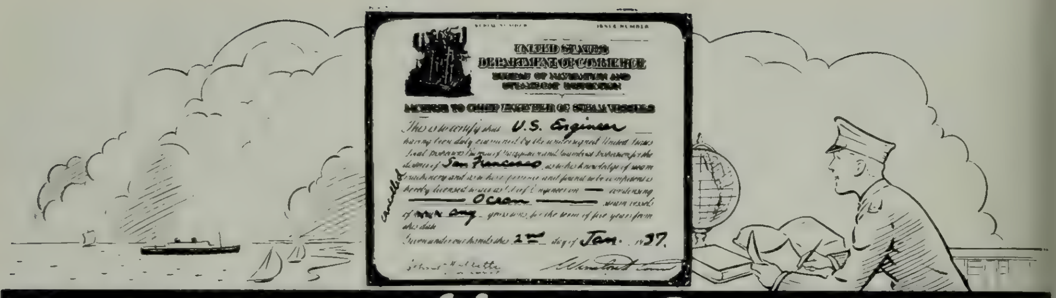
I am often asked how many of our employees on the waterfront are communists. I doubt whether any great percentage of them are actually members of the Communist Party. There is no question, however, that the program and the technique which has been adopted by some of the leaders on the waterfront is the program and the technique of the Communist Party. Under these circumstances actual membership of our employees in the Communist Party becomes an academic question. I hardly need point out that communism preaches class hatred and contends that employers and employees have nothing in common. The goal of the communist program is not cooperation between employer and employee, but disruption of industry through labor troubles which are used as a means toward the end of social revolution. It is difficult to develop mutual confidence with unions which are directed by leaders who subscribe to this philosophy, and whose members are being flooded with communistic propaganda as a part of a highly organized and effective campaign of class hatred.

Unfortunately, we have little direct personal contact with our employees and little opportunity to impress them with our sincerity of purpose. Our employees are furnished through hiring halls which are controlled by the unions. In many cases our actions are interpreted to the membership of these unions by those who have no regard for truth and who distort the facts for the obvious purpose of creating ill will.

Admitting that collective bargaining so far has not proven entirely satisfactory, we are still confronted with the fact that it is the only method of handling our labor problems which is now open to the maritime industry. The Wagner Act and our present contracts with maritime unions make it necessary for us to deal collectively with our employees. Our problem therefore is **to make collective bargaining work in spite of the many difficulties which I have enumerated.** We have no other alternative.

After participating in this coastwide experiment in labor relations for almost a year, I am convinced that collective bargaining in the marine industry will not succeed unless and until the Wagner Act is amended in certain particulars. The present act is decidedly unilateral in its application. It grants extensive privileges to labor without imposing any corresponding obligations. It imposes obligations upon employers, but grants them no privileges. One

(Page 47, Please)



UNITED STATES
DEPARTMENT OF COMMERCE

U.S. Engineer

San Francisco

Ocean

any

2nd *Jan.* *37.*

Cancelled

Your Problems Answered

by "The Chief"

The word "Cancelled" was inscribed on face of the above license at the direction of the Bureau of Marine Inspection and Navigation. As used here it means "Specimen Copy."

QUESTION

What are some of the terms used in connection with gears in general?

ANSWER

The terms used in literature and instructions regarding gears are sufficiently different from our general engineering language to warrant definitions.

Tooth—One of the carefully calculated number of projections on the rims of two cylinders or cones which prevent any slip when rolling against each other, by intermeshing.

Rim—The tire or cylinder from which the teeth project.

Spider—One or more wheels, spoked or solid, with their associated hub. The spider supports the rim or tire of large gears and permits the teeth to be made of more suitable metal than is necessary for the spider. Small gears are made solid without rim or spider.

Spur—This word is used to indicate a gear whose teeth are parallel to the center line of the shaft. This means that the shafts of a pair of mating gears are parallel.

Bevel—When the shafts of a pair of gears are not parallel but are at an angle to each other, usually 90 degrees, the teeth are cut in the surface of a pair of cones. These are called beveled gears.

Herringbone—This term is used to describe the arrangement of teeth on a wide rim. Instead of being parallel to the center of the shaft, the teeth are cut in the cylinder at a small angle, 15 to 40 degrees from their normal position.

When one half of the rim is cut with the slope in one direction and the other half in the other direction the teeth give the general impression of the backbone and ribs of a herring, from which this arrangement derives its name. Small gears may have only one slope, in which case they are called spiral, because the teeth follow the path of a spiral around the cylinder. The advantage of the herringbone gear is discussed later.

THE RECIPROCATING STEAM ENGINE

By A. R. McMULLEN
Superintendent of Machinery,
Federal Shipbuilding and Dry Dock Co.

You may rave of turbine engines,
You may rant of diesel drive,
You may make them all electric
And expect them to survive.

But have you stood beside the throttle
With your eye on boiler gage,
Have you watched the crossheads racing
As the tempests roar and rage?

Have you heard the pistons whizzing
Through a forty-eight inch stroke,
Have you seen the main links bucking,
Like a mustang never broke?

Have you seen eccentrics prancing
Like a stallion full of life,
Have you heard the air pump heaving,
Like a wrestler in the strife?

There is music there, and gladness,
There's a lilt to lift the soul,
There is power and dependence,
Though it comes from oil and coal.

With her heads all clean and polished,
And her paint all gleaming bright,
With her gages at two hundred,
She's a grand ennobling sight.

They can build them out in Egypt,
They can fix them in Japan,
For reciprocating engines
Are as old as any man.

U.S. Steel News

Tooth pitch—This is a measure of the tooth size and is the number of teeth per inch. It is the same as the **circular pitch,** also the circumferential pitch, being the circumference C in inches divided by the number of teeth on the gear. The circumference is measured on the pitch circle. (For definition see below.)

The tooth size is more frequently expressed by the **diametral pitch** being the diameter of the pitch circle D in inches divided by the number of teeth.

The **driven** gear, as the word implies, is moved or pushed ahead by the **driving** gear and receives power from it.

The **pitch circle** is a circle having the same center as that of the gea and passing through the point o contact between the driving and driven teeth, when this point is o the center line connecting the centers of the two mating gears. Thus the pitch circles of the mating gears are tangent (just touching eac other), and the nominal diameter o the gear is the diameter of the pitc circle, which is always less than th diameter measured across from ti to tip of the teeth.

The **addendum** and the **dedendu** are respectively the tooth heigh above and below the pitch circle The diameter of the **gear blank** int which the shape of the gear teet cut is therefore the diameter of he addendum circle.

The **speed ratio** of the mating ears is the reciprocal or inverse atio of the pitch circle diameters, nd also the reciprocal of the ratio f the number of teeth of the two ears.

The **hunting tooth** is an odd or ex-a tooth added to the number of eeth in one or both gears of a pair make the ratio of the numbers dd, i.e., the small number will not ivide into the large number evenly. his insures that any one tooth of he small gear will mate or contact ith each and every one of the teeth f the large gear before contacting tooth a second time. Thus if here is any wear or unevenness it ill be uniform on all the teeth.

The **pitch line** is an imaginary ne parallel to the axes of the two ears and drawn through the points f contact of the pitch circles. Refrence is frequently made to the **itch line velocity,** which is the vecity of the pitch circle, being the itch circle diameter multiplied by he speed in r.p.m. and the constant .1416. This also is the tooth veloity.

Cycloidal and **involute** are the ames of the geometrical curves rom which the contours of the tooth hape is fashioned. A cycloid curve ould be drawn by a piece of chalk astened on the side of an automoile tire if it were rolled along touchng the wall of the building. If the olling circle carrying the chalk or encil were rolled around the outside f the pitch circle it would generate r mark the shape of the addendum f a cycloidal tooth. Rolling it on he inside of the pitch circle will enerate the contour or shape of the edendum of a cycloidal tooth.

Wind a piece of string around ome cylindrical object whose axis s perpendicular to a sheet of paper. ut the pencil lead in a loop in the nd of the string and, keeping the tring tight, unwind it as the pencil arks the paper. The curve drawn s the **involute.** If the cylinder diamter is that of the pitch circle the urve is the shape or contour of the ddendum of the tooth. The dedenlum is a straight radial line on inolute teeth.

The effect of either the cycloid or involute shape is that the teeth roll against each other to a large extent, giving a minimum of sliding action.

The cycloidal shape is practically obsolete as far as modern high speed high power marine reduction gears are concerned. The involute shape is almost universally used.

The **single reduction** gear as distinguished from the **double reduction** gear accomplishes the speed change in one step. Normally the single reduction would consist of one pair of mating gears between the prime mover or driver and the load. The double reduction gear would then consist of two pairs of mating gears, the driven gear of the first pair being on the same shaft, or coupled to it as the driver of the second pair, the power being transmitted through the first pair, then the second, in series. It should be understood in this statement that the term "pair" refers to two different diameters of pitch circles, and that there may be one or several (2, 3, or perhaps 4) driving gears mating with the same driven gear, or vice versa. Thus two or three pinions may mate with one common gear and it would still be a single reduction set.

The **quill shaft,** as its name suggests, is a strong, stiff, hollow shaft on which is mounted an intermediate gear. By passing a solid shaft through the hollow **quill** and coupling to it at the other end, a resilient or cushioning link is provided in the gear train to absorb shocks. This is common construction in double reduction gears, particularly where two intermediate gears run in parallel on one main gear, as it helps divide the load between the two pinions.

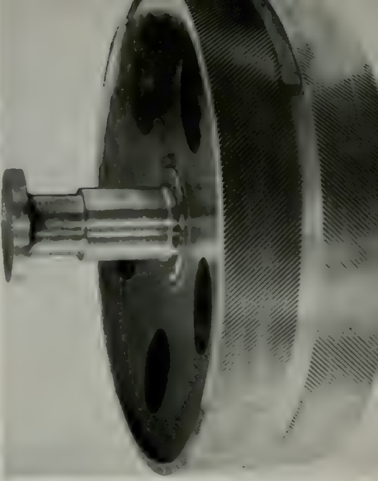
The **shroud** or **shroud band** is an annular band or flange around the gear at the ends of the teeth supporting them up to the pitch line and sometimes to the tips. It was originally used on cast gears, but is never used on cut gears due to difficulty of cutting.

QUESTION

● **What Determines the Horsepower Rating of a Set of Gears?**

ANSWER

The horsepower output of a set of gears is the horsepower input less the loss in the gear, which should not exceed 2½ to 4 per cent. Also, horsepower is the product of speed times torque or twisting effort. The unit of torque is the pound-foot and is the twist force due to a force of one pound at the end of a lever or wrench one foot from the center of the shaft. Expressing torque in pound feet then:



A slow speed herringbone gear from the speed reduction gears of a large vessel.

$$\text{H.P.} = \frac{\text{torque} \times \text{R.P.M.}}{5250}$$

The twist effort on the low speed shaft is, thus, more than it is on the high speed shaft by the ratio of the speeds. This accounts for the relatively small shafts on pinions as compared to the gear shafts.

The tooth pressure, however, is the same on both high and low speed gears, so that the stress on the teeth is the same. The tooth pressure is probably the most important limitation to the output. It is expressed as pounds of pressure or force per inch of face of gear. Two factors tend to limit the life of the tooth; the tooth pressure, and the number of times the tooth is placed under load. The former, if excessive, tends to crush the metal, causing it to flake or pit; the latter, to crystalize the metal and break off in small pieces if the load is too much. This clearly points to two designs, one for the merchant marine and one for naval use. In merchant service the load is at full value for the entire time of operation, while in naval use gears will run at full power for only five or ten per cent of the time they are run. For 90 to 95 per cent of the time, they run at less than one-third load. Therefore it is economical to design naval gears to run at full power on a great deal higher load per unit of size, greater tooth pressures, higher speeds than are permissible in merchant gears.

Loads may run from 200 to 500 or more pounds of force per inch of face of gear. The tooth pressure is directly affected by the diameter of the pinion. This is because deflection of the pinion or sag between its bearings causes the teeth nearer the center of the pinion to drop their load, forcing the outer teeth to carry an overload. Deflection under load of the pinion must be limited to less than .0009 inch. The larger diameters offer less deflection. A moderate safe loading for merchant gears is 50 pounds tooth pressure for each inch of pinion diameter. Thus a 10 inch diameter pinion would take a tooth pressure of 500 pounds per inch of face of gear.

Another important factor in gear capacity is the speed of the teeth. This tooth velocity is usually expressed as **pitch line velocity** in feet per minute. It is obvious that for a given H.P. capacity and speed ratio, the larger the diameter of the gear and pinion the lower the force, hence tooth pressure on the teeth. There are two limits to pitch line velocity. For low speed gears for slow ships the limit is the size of the gear which can be installed. For higher speed ships with higher propeller speeds we find a rather indefinite limit in the velocity at which we mesh a pair of gears and still lubricate, run quietly and give a good life. Normally the pitch line velocities will be around 5,000 to 9,000 feet per minute. There seems to be no doubt but that manufacturers will go to 12,000 to 15,000 feet per minute in the near future. This is 250 feet per second, or about 165 miles per hour, a truly terrific speed.

Widening the face of the gear increases its pitch line capacity but may increase the deflection of the pinion so that width and diameter must be increased together, thus pitch line velocity limits width of face.

Interestingly enough, the strength of the tooth is not a limit to gear capacity on high speed marine propulsion gears. Gear sets have been set up in test loaded to about 3,500 pounds per inch of face width, and run for nearly two weeks day and night before failure occurred. Hence the 300 to 500 pound nominally used is more than an adequate safety factor as far as tooth strength is concerned.

The limits to the capacity of a set of gears are therefore somewhat indefinite, and include tooth wear over an expected useful life, noise, application, shock load, and other considerations such that considerable good judgment and experience are necessary to balance all the factors.

Engineers' Licenses

The following list shows the licenses granted during the month of January to engineer officers of the merchant marine at Pacific Coast offices of the Bureau of Marine Inspection and Navigation. For key to abbreviations see footnote.

HONOLULU

Name and Grade	Class	Condition
Harold P. Westroop, Chief Eng.	OSS, any GT	O
Roy D. Donovan, 1st Asst. Eng.	OSS, any GT	RG
Walter C. Smith, 2nd Asst. Eng.	OSS, any GT	O
Harry J. Roes, 2nd Asst. Eng.	OSS, any GT	O
George L. Wahl, 2nd Asst. Eng.	OSS, any GT	RG
Louis D. Rhea, 3d Asst. Eng.	OSS, any GT	O
Paul Kane, 3d Asst. Eng.	OSS, any GT	O
Sampson Naahielua, Chief Eng.	OMS, 350 GT	O
McGregor H. Millar, 2nd Asst. Eng.	OMS, any GT	O
KETCHIKAN		
Ernest H. Sigurdson, Chief Eng.	OMS, any GT	RG
SEATTLE		
Ernest J. DuPraw, Chief Eng.	OMS, any GT	O
Lee Verrier, 2nd Asst. Eng.	OMS, any GT	O
Kenneth M. Malone, 1st Asst. Eng.	OSS, any GT	RG
Frank W. Nordstrom, 1st Asst. Eng.	OSS, any GT	RG
Edmund M. Edgington, 3d Asst. Eng.	OSS, any GT	O
Herman F. Zuppe, 3d Asst. Eng.	OSS, any GT	O
PORTLAND		
Sigurd L. Larsen, Chief Eng.	OSS, any GT	RG
SAN PEDRO		
John J. Kelly, 1st Asst. Eng.	OSS, any GT	O
Hervey H. Thomas, 2nd Asst. Eng.	OSS, any GT	RG
Peder Viddal, Chief Eng.	OMS, 750 GT	O
SAN FRANCISCO		
Clifford F. Greenlin, Chief Eng.	OSS, any GT	RG
Crispino Maggio, Chief Eng.	OSS, any GT	RG
Robert E. Christy, Chief Eng.	OSS, any GT	RG
John J. F. Knight, Chief Eng.	OSS, any GT	RG
John L. Connolly, Chief Eng.	OSS, any GT	RG
George J. Roehm, Chief Eng.	OSS, any GT	RG
Coyt N. Lapham, Chief Eng.	Inland SS, any GT	RG
Albert R. Johnson, 1st Asst. Eng.	OSS, any GT	RG
William W. Monty, 1st Asst. Eng.	OSS, any GT	RG
Raymond M. Vallon, 1st Asst. Eng.	OSS, any GT	RG
Frank Flanner, 1st Asst. Eng.	OSS, any GT	RG
Arthur S. Marshall, 1st Asst. Eng.	OSS, any GT	RG
Sidney S. Truesdell, 1st Asst. Eng.	Inland SS, any GT	O
Mendel F. Barwald, 2nd Asst. Eng.	OSS, any GT	RG
Walter E. Hinshaw, 2nd Asst. Eng.	OSS, any GT	RG
Calvin James Fleming, 2nd Asst. Eng.	OSS, any GT	RG
Donald Charvo, 3rd Asst. Eng.	OSS, any GT	O
John B. Obiols, 3d Asst. Eng.	OSS, any GT	O
Anthony G. Autiere, Chief Eng.	OMS, any GT	O

Abbreviations: GT is gross tonnage; RG is raised grade; O is original license; OSS is ocean steamer; OMS is ocean motorship.

For American Deck Officers

Salvage Work in Strandings

When a vessel has run aground, t question of refloating her must dpend upon the amount of damage se has suffered, for if she is found t be making more water than the sip's pumps can cope with she would cviously be better left where she is util salvage assistance and a diver t attend to the leak can be obtaine. If, however, the ship is not leakig, or only leaking slightly, and prticularly if there be some rise ad fall of tide to help with the cpth of water required, an anchor vith the longest available scope of vre hawsers, known as a ground tckle, should be laid out as quickly a possible in the most suitable dirction as ascertained by soundings tken for that purpose.

The difference in the draft of the ssel when aground and the draft loat must be noted, and will large determine whether or not it is necsary to lighten her, and to what tent.

If the stranded vessel is pounding the bottom, any empty ballast nks should be filled to help to keep r quiet until assistance arrives d while the anchors are being laid t.

On no account, nor in any circumances, must any time be wasted in ying to haul the vessel afloat with kedge or stream anchor only, ther being worse than useless for e purpose, and can be hove right me in a few minutes with any od steam winch, however good the lding ground.

The largest and heaviest bower nchor available is the only one orth considering.

Unless the holding ground is exptionally good, even this will pro-

(Page 41, please)

Deck Officers' Licenses

The following list shows the licenses granted during the month of January to deck officers of the merchant marine at Pacific Coast offices of the Bureau of Marine Inspection and Navigation. For key to abbreviations see footnote.

HONOLULU

Name and Grade	Class	Condition
Joseph F. Acker, Jr., Chief Mate	OSS, any GT	RG
Ray J. Mecker, 2nd Mate	OSS, any GT	O
Gerald J. Havel, 2nd Mate	OSS, any GT	RG
John C. Dyer, 3d Mate	OSS, any GT	O
James Woods Mills, 3d Mate	OSS, any GT	O

SEATTLE

Name and Grade	Class	Condition
Richard E. Walker, Master and Pilot	OSS, any GT	RG
Robert H. James, Chief Mate and Pilot	OSS, any GT	RG
Ernest W. Stage, Chief Mate	OSS, any GT	RG
Rudolph Birch, 2nd Mate	OSS, any GT	RG
James T. Hill, 3d Mate	OSS, any GT	O
Eugene W. Hundley, 3d Mate	OSS, any GT	O
George G. Roberts, 3d Mate	OSS, any GT	O

SAN PEDRO

Name and Grade	Class	Condition
William E. Miller, Master	OSS, any GT	O
Thomas R. Hardman, 2nd Mate	OSS, any GT	O
Harold E. O'Dell, 3d Mate	OSS, any GT	O

SAN FRANCISCO

Name and Grade	Class	Condition
Allan G. Erickson, Master	OSS, any GT	RG
Joseph J. Jensen, Master	OSS, any GT	RG
Oscar Hald, Master	OSS, any GT	RG
Kenneth F. Izant, Chief Mate	OSS, any GT	RG
Victor V. Long, Chief Mate	OSS, any GT	RG
Ingvald Molaug, Chief Mate	OSS, any GT	RG
Ralph G. Wilson, 2nd Mate	OSS, any GT	RG
Walter Napier, 2nd Mate	OSS, any GT	RG
Allan T. Brown, 2nd Mate	OSS, any GT	RG
Austin E. Brady, 2nd Mate	OSS, any GT	O
William F. Cannarr, 2nd Mate	OSS, any GT	RG
Howard E. Halterman, 2nd Mate	OSS, any GT	RG
Ralph E. Peters, 2nd Mate	OSS, any GT	RG
Alan L. McCarthy, 2nd Mate	OSS, any GT	O
Jack J. Hughes, 2nd Mate	OSS, any GT	RG
John H. Hayes, 2nd Mate	OSS, any GT	RG
Odd Froyland, 3d Mate	OSS, any GT	O
Edwin B. Eastman, 3d Mate	OSS, any GT	O
William S. Indig, 3d Mate	OSS, any GT	O
Warren W. Bradley, 3d Mate	OSS, any GT	O
Preben B. Ludvigsen, 3d Mate	OSS, any GT	O
Thomas T. Andersen, Mate	Inland SS, any GT	O

Abbreviations: GT is gross tonnage; RG is raised grade; O is original license; OSS is ocean steamer; OMS is ocean motorship.

Meta-K

Junior Mariners

The Story of a Practical Effort in Training American Boys for Life at Sea

Many students of the genus homo have declared that "man's character is best revealed in his hobbies." That being so, then let us present to our readers the story of one man's hobby, which has worked out in a very practical way to bring pleasure and profit to himself and to many of his neighbors.

L. F. Bosshardt is a commuter. He lives in Redwood City and earns his living in San Francisco. Formerly he was a seafarer, and holds an unlimited American Master's Certificate.

In conversation with parents of boys and in observation of neighborhood high school boys during out of school hours, Mr. Bosshardt, like every other American who thinks on these things, began to wonder what these boys would do to make a living. Only a small proportion of them were headed for college. What about the others? Where would they go to work? Conversation with the boys developed the fact that few of them had any ideas at all about their own future. Thinking on these things gives most fathers a headache, but with L. F. Bosshardt it led to action.

He was in touch with shipping executives and knew they would welcome the chance to take on their ships boys who had training in seamanship. He sounded out some boys —found several very much interested—invited them to his home to talk it over. As a result there was formed the "Junior Mariners" of Redwood City, California, and Mr. Bosshardt had found a very profitable and interesting hobby.

Soon there were 21 registered as members, and a waiting list larger than the membership. Bosshardt was master mariner, with a full crew and no ship. Twice a week they met for study. Looking about for possibilities, they found a 45 foot schooner, the Meta-K, waterlogged and in pretty bad shape, stuck in the mud of the old yacht harbor on Redwood Slough. They approached her owner, G. K. Kneese of Redwood City, and he gave them the ship for free use. Those 21 boys, under the direction of their master, got the water and mud out of the hull, cleaned her up, patched her neatly, painted the hull inside and out, and soon had her floating proudly at the wharf.

Then, as part of their seamanship course, they rigged her, made her a suit of sails. By this time the whole Redwood City Harbor crowd began to take notice. Rope and canvas and other materials were donated, and soon Meta-K was ready for bay cruising. By this time, too, a classroom space on the upper floor of the old yacht club was set aside for this boys' organization by the Harbor authorities.

Most of these boys come from families who are unable to put much money into such a scheme, so from the start expense has been kept to a minimum. Through cooperation of a friendly storekeeper an inexpensive uniform was designed. As will be noted in the pictures, this consists of dark blue jeans, a white sweat shirt, and a dark blue zippered sweater.

The Meta-K is used for week-end cruising. Her cruising complement is nine boys. On the cruise each boy carries out specific duties as a member of the crew. They run the ship under supervision of the master. In seamanship drills they learn all the ancient arts of ship rigging, sail management, navigation, and ship housekeeping.

The nature and scope of the work and training is best shown by the final examination given to the older boys on January 3. Three boys passed this test with flying colors, and these three are now cadets on an

On board Meta-K and in their class-room the Junior Mariners are taught knots, splicing, sailmaking, and all the arts of good seamen.

American cargo vessel. Following are the questions of the test:

1. Describe the flag of the United States. Give a brief outline of origin of same.

2. What are the duties of a lookout at sea? When are lookout watches stood at sea?

3. What is meant by the following: Abaft the beam, broad on the quarter, port bow, abeam, dead ahead, aft, and a quarter seven, by the deep four, quarter less sixteen, bilge, garboard strake, sheer strake, running rigging, boom guys, topping lifts, fore stay, mizzen mast, threefold purchase, halyard, gaff, hatch, companionway, wheel ropes, rudder, pintles, gudgeons, waterline, mean draft, boat falls?

4. Box the compass.

5. What are the markings of a twenty fathom hand lead line?

6. What is a sounding machine and what used for? What is meant by arming the lead?

7. Describe the lights carried by a steamer under way. Under way but not under command. What must a vessel show during the day while at anchor? Same at night?

8. What does the rapid ringing of the ship's bell, together with the sounding of the general alarm, mean? What does seven blasts on the whistle, supplemented by a like number of bells on the general alarm, mean?

9. How do you find your boat and fire stations aboard the ship?

10. Describe the sound signals for a steamer in fog, mist, or falling rain or snow. Same for sailing vessel.

11. Name the parts of an anchor. What is a wildcat? Where is the chain stowed? What are hawse pipes? What are chaucks?

12. Describe the patent log. What is it used for?

13. What is the procedure in applying artificial respiration to the apparently drowned? How do you apply a tourniquet?

14. Describe what you believe to be some unsafe practices aboard ship.

15. Who is in command of a vessel, and by what title is he always addressed? How would you speak to any licensed officer aboard ship?

16. What is meant by the following orders: Right rudder 10 degrees; rudder amidship; ease the rudder; meet her; steady?

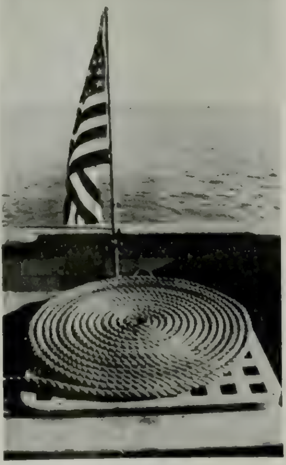
17. How many points in a quadrant of the compass? How many points in the compass? How many degrees in a point?

18. What is your fire station on the Meta-K? What is your station for making sail? What is your station for entering or leaving port?

19. What is a hawser? What is it used for? What is a buoy? What is a beacon?

20. Upon being relieved at the wheel what do you do? How are lifeboats numbered aboard ship?

In the event of your passing this test and being given employment, do you promise that you will do your best to perform your duties in a seamanlike manner and to bring credit rather than discredit to this school and to all your shipmates?



Stern of the Meta-K. Shipshape and Bristol fashion, Old Glory flies over a clean, smart ship.

We recommend to our readers that they test themselves on this examination and do a little research to find the correct answers to these questions. And we salute the Junior Mariners of Redwood City and extend to them and to their Master Mariner our best wishes for good success. We hope that many masters may adopt this interesting and helpful hobby.

Monthly Review of Tanker Markets

By Oscar J. Beyfuss

San Francisco,
February 15, 1938.

You will see from this review that, while there have been some downward rates, the tendency of strength permeates nearly all the markets which are the subject of this synopsis.

TIME CHARTERS

Three years has been done at 8/6 and also a similar period at 7/3 with the first year clean. A steamer gets 7/6 for two years beginning June/-July.

VOYAGE CHARTERS

AMERICAN—Gulf to North of Hatteras: Fixtures for heating oil rose to 41c and then receded sharply to the lower thirties. Crude rates followed and the latest for light crude was about 33c.

Intercoastal: Still no transactions announced.

FOREIGN—Gulf to U.K. Continent: The latest in this trade for clean business was 32/9 and dirty fixtures rose to 27/6.

California to U.K./Continent: Nothing new.

Black Sea to U.K. Continent: This trade was quiet in both dirty and clean. A lube fixture was reported at 28/-.

California - Australia and New Zealand: No charters, but a fixture is reported dirty Sumatra/Wellington at 27/6.

California - Orient: In this trade to Japan rates rose to 31/-. A number of boats were taken for multiple voyages at 30/- and 31/- and two are announced for nine consecutives beginning the middle of the year at 22/6. A fixture from the Gulf to Japan is reported at 35/-.

Pacific Coast
Wire Drag Surveys in 1937

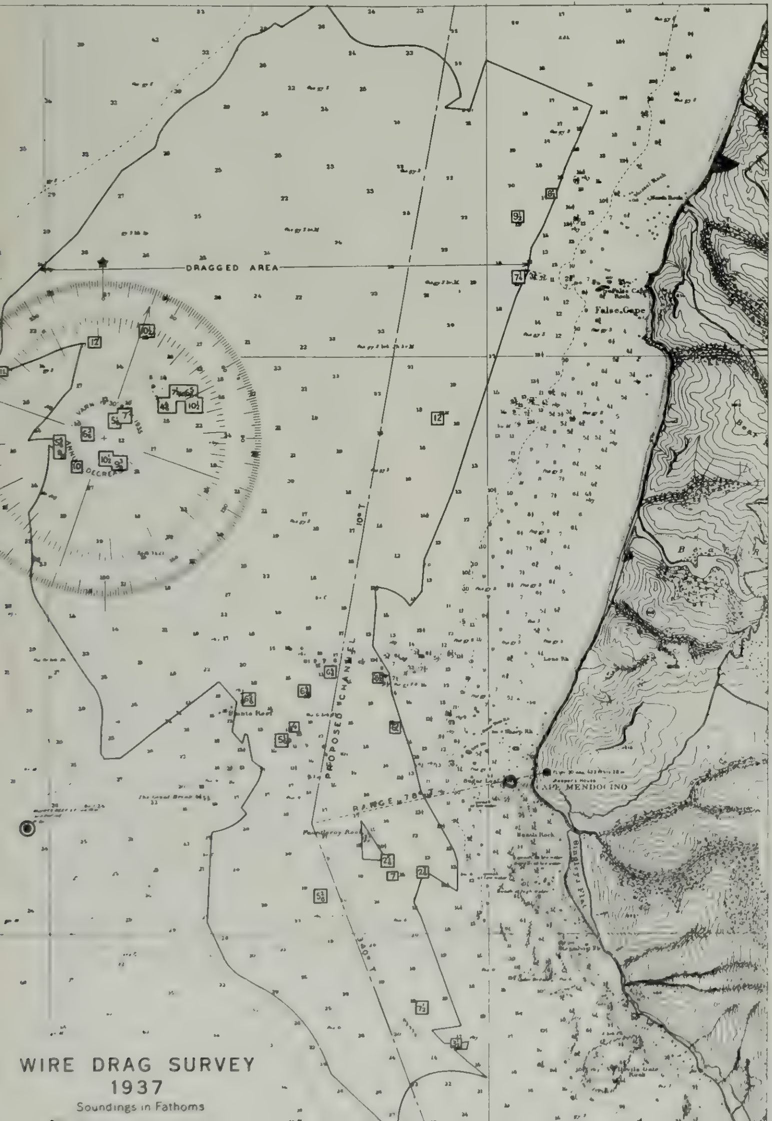
By I. E. Rittenburg

Hydrographic and Geodetic Engineer, U. S. Coast and Geodetic Survey

During the season of 1937, two widely separated areas were wire dragged, one off Cape Blanco, Oregon, and the other off Cape Mendocino, California.

The Cape Blanco and Port Orford area was wire dragged at the request of the U.S. Engineer Corps, because of a proposed breakwater to be built at Port Orford. Although this area had been resurveyed recently by ordinary hydrographic methods, a total of 56 heretofore unknown rocks were located by wire drag. Many were relatively unimportant, but several were hazardous, and one was extremely dangerous to coastwise shipping. The latter, a very small pinnacle, very difficult to locate even after the drag had caught upon it, was found fifty feet off the end of the lumber company's dock at Port Orford, with a least depth of 16½ feet over it at mean lower low water. Whether or not this rock would ever have been found by ordinary hydrographic methods is doubtful. It is a remarkable fact that vessels drawing 20 feet or more have been maneuvering around it for several years without hitting it, since its position is such that in mooring to the dock, a vessel turning around on its anchor must pass over the rock. Acting on the findings of the Coast and Geodetic Survey, the lumber company, which ships from Port Orford, blasted this rock out immediately.

Another interesting discovery at Port Orford was a shoal with a least depth of 24 feet. Several leadsman reported that their leads felt as though striking wood on the bottom. Thinking that there might have been a wreck at this point, inquiries were made of several of the "old timers." While none remembered any wrecks or wreckage, the inquiries soon became known and imaginations ran riot. Of the many theories evolved, one concerning a ship laden with



WIRE DRAG SURVEY
1937
Soundings in Fathoms

treasure, became so popular that before long reports made it a fact. Newspapers along the West Coast published an item to the effect that the obstruction was the ship South Fork, lost with all hands and without trace. This, of course, was all imagination, as no one has ever investigated the obstruction. The most logical assumption seems to be that it is part of a log raft, or a water-logged and submerged mooring buoy.

Upon completion of the surveys off Cape Blanco, the wire drag operations were moved to the vicinity of Blunt's Reef, off Cape Mendocino, California. Practically all shipping, whether north or south bound, makes Blunt's Reef Lightship a turning point. For this reason, this area is one of the most important and congested on the entire coast. Because of the heavy seas and fog prevalent for a large part of the year, and the broken and rocky character of the bottom with numerous dangers inshore from the lightship, it is also one of the most hazardous.

Until the latter part of the nineteenth century, a great many northbound ships used the passage inside Blunt's Reef to avoid the heavy seas encountered on the stretch from Punta Gorda to around Blunt's Reef. However, the frequency of accidents due to vessels striking rocks, as well as the uncertainly as to whether or not these dangers were charted, resulted in underwriters refusing to insure cargoes and vessels using this passage. Anyone familiar with this stretch of coast knows that a safe passage inside Blunt's Reef would be a boon to the smaller steam schooners and yachts beating north against the prevailing heavy northwest winds of summer. The wire dragging of this area, in order to prove once for all whether or not a safe channel exists, was therefore considered of primary importance. The greater portion of the Blunt's Reef area has now been dragged, and a total of 33 previously unknown pinnacle rocks located. The accompanying illustration demonstrates graphically that several of these pinnacles constitute grave present dangers, and many more might prove to be hazardous if the new channel, mentioned later, is used.

The group of rocks lying three to four miles northward of Blunt's Reef Lightship is on the direct steamer route to Humboldt Bay. Of this group the 28-foot rock is, of course, the most dangerous. Considering the prevalent heavy swells, one wonders why, as yet, no vessel has reported striking it. The 20-foot shoal (appearing as the southernmost in the illustration) is definitely hazardous, since many of the northbound steam schooners parallel the shore to this vicinity, turn out, head for the lightship, and pass between the lightship and Blunt's Reef.

An inside channel has now been dragged to a depth of 35 feet or more, showing a safe passage at least one mile in width. Most of the unknown dangers found would not have been located by ordinary hydrographic methods, regardless of the spacing of lines used. This may be seen on the accompanying illustration, which is a section of U. S. Coast and Geodetic Survey Chart No. 5795, where many of these rocks are shown rising from deep water without indication. It is believed that, if buoys are placed at strategic points, a safe passage exists for vessels drawing up to 24 feet. Vessels able to use this channel would save from four to eight miles in distance, depending upon destination, and would avoid the more exposed outer area. The proposed channel is indicated by dashed lines on the reproduced chart section.

(Extract from an article in Field Engineers Bulletin, U. S. Coast & Geodetic Survey, December, 1937.)

An Excellent Idea

Here is a new idea for customs officers that should be adopted by all civilized nations—a school in courtesy for customs officials. The story comes to us from Transat News, the monthly publication of the French Line, as follows:

"A novel school for customs inspectors is being opened this year (1938) at Montbeiliard, near the Franco-Swiss border, to instill in all inspectors the importance of courtesy and consideration to be shown toward tourists, and to teach the officers every angle of their profession. The first Frenchman whom the traveler meets is usually the customs inspector, and it is he who is responsible for the visitor's first impression of the country.

"The school, which is sponsored by the French Ministry of Finance, will conduct courses in French customs law and in the preparation of reports. Each student will be required to make thorough study of the customs code and to memorize the principal items on the free list. He will even be taught how to recognize and trap smugglers, and will, of course, know how to evaluate all merchandise with accuracy.

"The main theme of this school is **courtesy**, for before all else an inspector's duty is to receive tourists with politeness, and to make him feel quite welcome in France."

Some Shipwrecks I Have Seen

From "Fifty Years as Master Mariner"

By Captain Christen Julius Klitgaard*

The men who go "down to the sea in ships" and calmly risk their lives to save others do so, not because it is their duty or at some king's command; not for pay or worldly honors but out of love for their fellow beings. The combers may break ever so high and fiercely on the shore; the night be ever so cold and dark; when a ship needs succor the fisherman is ready and willing to risk his life in an endeavor to save those in peril—without question or thought for self. This calls for an unselfish kind of courage; a particularly calm and cool mind, to stand on the beach during a stormy, dark and icy-cold night and be ready, without question, to man the boat that is to attempt to force its way through the mountainous breakers, far out to the ship on the reef. He hears the cry for help that comes from over the stormy sea, but from behind him there reaches his ears a more poignant cry for help—'tis the cry of his wife and of children. They have no wish to hold him back; no other thought than that he should do his best for those in peril; but they cannot smother the fear and the thought that mayhap when they see their loved one again, it may be but his lifeless body. This is a form of heroism and self-denial that exists nowhere but on such coasts where shipwrecks abound. It is comparatively easy to die in defense of the truth, or for those dearer to us than life itself; but to die for a stranger; a man you have never seen before; a man perhaps of different creed and color than yourself; perhaps even of an unfriendly race; takes real courage a courage inspired from God Himself.

Captain Christen Julius Klitgaard.

There was an English brig that went ashore about four miles from Blokhus. By this time the town had been provided with a lifeboat and this was wheeled down to the water and with six men on board it started out towards the wreck. It was a particularly disagreeable winter night and the ship, which lay on the outer reef, was very hard to reach, especially as one of the masts had broken and was swishing around the hull, a great menace to the approaching boat.

Several attempts were made to reach the ship, and for each attempt a new crew was required, it being necessary to take the old crew to my father's house to be thawed out; their clothes actually being frozen to their bodies. This same terrible cold also affected the crew on the ship, and one by one they fell down and were washed overboard, till only two were left and these also would undoubtedly soon go the way of their comrades. It was heartrending to feel that they were beyond all human effort to save them.

The men who had made the first attempt were now warm and comfortable again and were called upon to make another try as no more relief men were available. Svendsen who was the leader of the life boat, did the only possible thing that coul be done to save the last survivor, there now being but one man left aboard the fatal ship. The life boat was rowed right out past the wreck and then backed in as close as pos ble. This was a very hazardous and daring undertaking, and became stil more so when it became apparen that the lone survivor did not hav enough strength left to catch th line that was thrown to him. Svendsen realized that if the man was t be saved someone must jump overboard and get to the wreck, so taking the risk upon himself he jumpe and safely reached the wreck. Here he tied the line around the man an threw him overboard and jumpe over after him, both being haule safely into the boat. It was a grea wonder that our boat lived throug this terrible ordeal, as most of th time it had, of necessity, to la broadside to the breakers, but the crew were able and skilled i the handling of boats they reache shore in safety.

Not one of these brave, hardy me received a penny for their hero labors—not even an honorable me tion. No, it was an everyday affai and the men themselves were sati fied and happy that they had be able to save even one life. They loo ed for no other pay or honors.

A second shipwreck happened the winter time; also during t night and an exceptionally cold o It was a Norwegian bark this ti and several attempts were made reach the distressed ship witho success. After each attempt, as u ual, a new crew was needed wh the former crew was being thaw ol and made warm again. A little aler midnight the moon came out ad still another attempt was made treach the ship (my brother was amember of this crew). This time thy were successful, and after workir all night the bark's crew was sfely brought ashore.

---

*This book is the memories of Captain Klitgaard, written especially for his own children and published by them for private distribution. This excerpt is published through the courtesy of his son Carl E. Klitgaard of New York.

At another wreck, after the lifesing crew had worked faithfully f into the night and could work no lger, a young fisherman with some ohis friends manned a fishing boat ad started for the wreck. As they wre nearing the wreck the ship bke to pieces and unfortunately its eire crew perished.

It is, of course, very seldom that arew can be saved under such circnstances, but I once did see eightn or twenty men from a wrecked Issian-Finnish ship come safely ahore on the poop deck of their vecked ship. I remember, also, that aer these men had been warmed up with a toddy or two and got into dry clothes, they began to fight with knives. My mother came in and stopped the fight without trouble; she knew no fear but simply walked in among the men and quietly took away their knives.

At another time a large Portuguese ship was wrecked on the coast and its entire crew saved. Before they landed a coal black pig came swimming ashore and disappeared among the sand dunes. Though we searched for it, the pig could not be found, and the fishermen were sure that it was not a pig at all, but was actually the Devil's assistant. However, a year or so later a lot of coal black pigs were seen at the small place of a farmer in Jetsmark, and as black pigs were previously unknown along the coast, he undoubtedly had caught the Portuguese pig and placed it among his other pigs.

Father was always an early riser and even in winter he used to get up at four in the morning and take a walk along the beach. One winter morning as he was strolling along to see that all was in order, as it had blown a gale during the night, he suddenly stumbled over two dead bodies. On closer investigation he discovered much wreckage strewn about the beach, and when daylight came it was evident that a ship had been wrecked during the night and had broken up before its crew had been able to signal for help; all the wreckage was new and the eight bodies had apparently been dead only a few hours. These bodies were brought up to our house where mother clothed them and prepared them for burial, and the whole town was present at the funeral. It wasn't until long after the occurrence that a chest was found, containing papers which proved the ship to have been a German bark.

Bethlehem Union Plant Launches a Destroyer with a Very Famous Name

On Monday morning, February 14, a 11:15, the Potrero Works of the Uion Plant of the Bethlehem Shipilding Corporation, Ltd., launched t U.S. torpedo boat destroyer ury into the waters of San Franco Bay. This ship is the second of to destroyers building at the Potro (Union Iron) Works. She was snsored by Miss Virginia Lee ury Werth, granddaughter of tthew Fontaine Maury, for whom ts ship was named.

Were it not for her name this ves- would be just another destroyer. e name makes her unique. She is obably the only vessel in the Navy med for a former naval officer on hose head the United States once aced a price.

Matthew Fontaine Maury was one the great figures in American val, scientific and educational cirs before the Civil War, and as his work in the Navy had great value to commercial shipping we may well set down here some of his accomplishments.

He came to the Naval Academy from the western end of Virginia about 1825. His first long practice cruise was on the frigate Vincennes. When the ship was becalmed for a week or two in the South Atlantic, young Maury was surprised that she had lost the wind and had the nerve to ask his superiors why. He was sent to the masthead to look for the wind.

Later, on a naval surveying expedition on the coast of Nicaragua, he fell and was injured so that he had to be invalided ashore for light duty.

He was next appointed to the new naval observatory as astronomer's aide. Here he obtained permission to start a real search for the wind. Making friends with shipping executives and the masters of sailing ships, he induced them to put down in their logs at certain times daily the direction and force of the wind.

In a few years he was able to begin publication of wind rose charts of the various oceans. The use of these charts immediately cut down the average time required for sailing ship passages and undoubtedly was responsible as much as any other one factor for the record passages of clipper ships.

Maury then turned his attention to the study of ocean currents, and many matters affecting geography and oceanography. His school geographies and his books on the geography of the oceans were very popular in America in the fifties of last century. Some of them were translated into most of the European languages and are still popular over there.

When the Civil War came Maury elected to serve his native state. He became virtually Secretary of the Navy in the Confederate cabinet. He invented submarine mines to protect the Southern harbors. In the excitement after the assassination of President Lincoln rewards were offered by Congress for the capture dead or alive of Jeff Davis and all of his cabinet. Maury escaped to England, where he was given a bounty by British shipping interests for his free services to world shipping.

Later he went to Mexico and served as minister of education for Maximillian. Then he was extended a pardon and came home quietly to Virginia, where he died in 1873.

The Hydrographic office of the U.S. Navy still publishes the wind and weather charts. Upon the margin of all these charts in recent years there has been printed acknowledgment of the fact that the charts are based on researches begun in the early 19th century by "Matthew Fontaine Maury, then a lieutenant in the United States Navy."

Modern Treatment of Marine Boiler Feed Water

Some Notes on Satisfactory Operation of Marine Boilers from the Operating Engineer's Standpoint

By M. C. Wright

Chief Engineer

With the advent of higher steam pressures in the operation of marine equipment came sundry problems. Among them was the question of boiler maintenance. As we all know, the prime factor in prolonging the life of a boiler and in maintaining uninterrupted service is cleanliness. If you can keep the water side of the boiler free from scale and deposits and at the same time reduce corrosion and pitting, your boiler troubles are bound to be reduced considerably.

In my years of marine practice I have seen boilers in various conditions; some so dirty that the steam generated could hardly find an outlet, others losing tubes continually, and still others in good condition. But in the best of them there was that scale formation which had to be removed periodically and also there was considerable corrosion and pitting.

About a year and a half ago I was assigned to a job that was somewhat different than the majority of marine installations. This vessel was equipped with two of its original Scotch boilers but the third one had been removed and replaced by a 500 lb. pressure water tube boiler. Shortly before the ship was ready for service the question of boiler water conditioning was brought up. In view of the fact that the plant had not been equipped for any special process for treating the boiler water, and also because it was recognized that obsolete methods of using compounds were out of the question at this temperature, it was necessary to use raw water for boiler feed make up for all the boilers, including this high pressure boiler, which was to be operated at 400 lbs. per sq. in. After some discussion it was decided to use the Hall System of Boiler Water Conditioning, which is the modern system of chemically treating the water in the boiler.

The chemicals used in this system are: Hagan Phosphate, Flake caustic soda and Santosite. Hagan Prosphate is the trade name of metaphosphate, which tends to lock up the calcium in the water, preventing scale formation and forming a tricalcic phosphate which remains in suspension and is easily blown off. It also tends to lower the alkalinity of the water. The flake caustic soda is used to maintain the desired alkalinity. Santosite is sodium sulphite and is used to remove the oxygen in the water and forms a sodium sulphate which assists in maintaining the desired sulphate/alkalinity ratio.

As this was my first experience with any such system I was dubious of its results, but after a year and a half with it I am satisfied that it is **the** system. At times the returned condensate to this boiler was polluted with fish oil and at other times with foreign matters from the reserve tanks. But to date there has been no scale formation and no indiction of corrosion or pitting. It has not had a brush or rotary cleaner in the tubes and has only been washe out three times. There is only a ligh deposit of phosphate dust on th surfaces on the water side of thi boiler, which can easily be wipe off.

This condition has been maintained in spite of the fact that we use as much as 120 tons of raw wate make up in twenty-four hours an the chlorine density reached 15 grains per gallon at one time.

The Scotch boilers are cleane now than they were eighteen month ago.

Naturally with such conditions existing in the boilers our cost of maintenance has been reduced to a minimum. And the cost of using this system has been no more than the cos of the average "boiler compound. But the engineer in charge must follow his water tests and analyse faithfully and feed the chemicals t the boilers properly to maintain thi condition.

Ship to Shore Radio Telephone Service

Standardized 50 Watt Equipment for Coastwise and Harbor Shipping

New convenience and dependability in marine radio telephone service is brought to those who ply coastal and harbor waters in yachts, tugs, trawlers and various other types of pleasure and commercial craft. The latest 50-watt equipment offered by the Western Electric Company and known as type 224A is designed specifically for this service. It incorporates several new features which simplify its operation and extend its scope of performance.

With ten frequencies available in the new transmitter and receiver, vessels carrying this equipment are enabled to transfer quickly from the frequency of one shore station to that of another as they pass from one zone into the next. Nine frequencies are provided for communicating through these shore stations which serve to link the telephones aboard vessels with those ashore in the Bell System. The tenth frequency may be used either for communicating directly with the Coast Guard service or for ship-to-ship communication without working through intermediate shore stations. However, the shore stations stand ready to link ships which are not in direct communication with each other.

Through the facilities of shore stations established for the purpose, this equipment enables persons cruising along the coast or in harbors and inlets to call the office or the home ashore. Likewise, persons ashore may pick up the nearest Bell System telephone and call those aboard vessels suitably equipped. Shore stations for this service are located at Boston, New York, Miami, Los Angeles, San Francisco and Seattle, and another is under construction at Norfolk.

The selective ringer, which is incorporated in Western Electric's new 224A marine radio telephone equipment, makes it possible for the operator ashore to "dial" the particular boat for which a call is intended. The telephone bell aboard that boat rings in response to this call, thus eliminating the necessity for "monitoring" all calls with a loudspeaker (a source of continual disturbance) or for prearranging special schedules.

The radio transmitter and receiver, including the antenna switching relay, are automatically transferred from the "send" to the "receive" condition by means of voice controlled relays. The "press-to-talk" key previously used in this type of equipment has been eliminated. The transmitter and its companion unit, the receiver, are mounted on a common chassis which may be fastened to a bulkhead or to the deck. A small rotary converter may be employed to deliver the necessary 110-volt alternating current from the vessel's direct current supply. Both the transmitter-receiver combination and the rotary converter may be installed below decks in some out-of-the-way recess of the boat, while the telephone instrument itself may be placed in the wheelhouse, the owner's stateroom, or some other convenient location. Additional telephone handsets may be provided for other desirable locations.

In place of the dial on the base of the handset mounting, there are substituted convenient remote control facilities, including a master control switch, a volume control knob, an indicator light and a momentary contact switch. This last device may be arranged to transfer the transmitter immediately from the ship-to-shore frequency to the Coast Guard frequency or the ship-to-ship frequency. Upon replacing the handset in its cradle, the transmitter is automatically returned to the ship-to-shore frequency for which it was previously set.

The nine ship-to-shore frequencies provided in the transmitter and the receiver may be selected by means of two rotary switches provided for this purpose. Only when a vessel cruises from the zone of one shore station into the zone of another is it necessary to change these adjustments. These nine frequencies and the tenth frequency which may be selected at the remote control unit, are all crystal controlled. Vessels equipped for this service transmit to the shore stations on frequencies from 2100 to 2200 kilocycles, and receive from the shore stations on frequencies from 2500 to 2600 kilocycles. The ship-to-ship frequency is 2738 kilocycles, and that employed for communicating with the Coast Guard is 2670 kilocycles.

The equipment requires no specially trained personnel to operate it. The regulations of the Federal Communications Commission permit the operation of radio telephone equipment in the marine service by persons holding a radio telephone third class operator's license. The owner, the captain or a member of the crew may obtain this license by passing the examination prescribed by the Federal Communications Commission, requiring only an elementary knowledge of the radio laws and regulations and familiarity with the method of operating the equipment. No knowledge of the radio telegraph code is necessary. The license, of course, is required only for the technical operation of the equipment and does not apply to passengers, guests and others who may have occasion to use its telephone facilities.

Weather Atlas of the World

Weather-Beaten Log Books Yield Authentic Records of Last Century Weather at Sea

A group of Works Progress Administration workers in New Orleans is poring over a set of weather-beaten volumes.

The volumes are log books handed down from the early days of American shipping, and these W.P.A. workers are clerks engaged in compiling a weather atlas of the world under the direction of W. F. McDonald, chief of the U. S. weather bureau in New Orleans. The log books came from the archives of the U. S. hydrographic office in Washington.

In 1844, Lieutenant Matthew Fontaine Maury, then a young naval officer, became interested in a subject we now know as oceanography. He wanted to know more about water currents and prevailing winds, and he solicited the aid of American sailing masters in supplying the information he desired. Granted special permission by the navy department to continue his studies, Lieutenant Maury became the navy's first hydrographer.

The sailing masters themselves realized the need for more definite information about the oceans, and they cooperated heartily. From the world over log books poured into the office of Lieutenant Maury, whose clerks checked the day-by-day chronicles of weather reports and charted the seven seas.

U. S. naval vessels were ordered to keep special charts of weather conditions, and we find among these priceless log books one from the U. S. S. Constitution, which in the late forties cruised along the coast of Africa on an expedition.

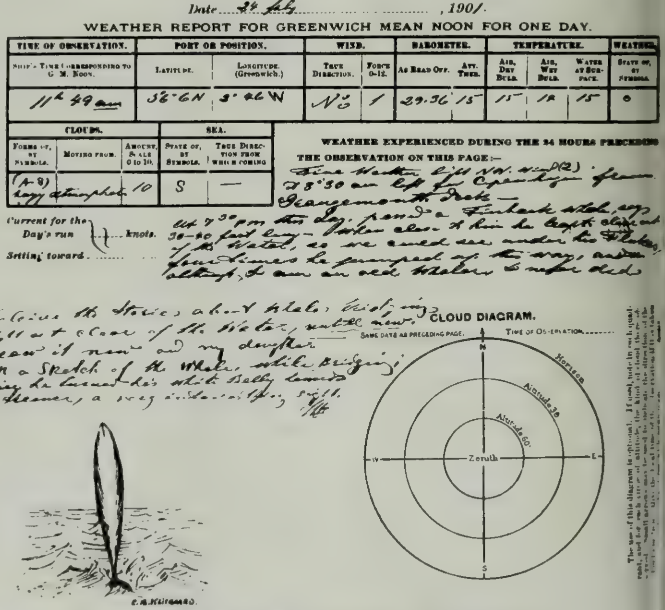
The oldest of these log books thus far surveyed by the W.P.A. workers was that of the British sailing vessel Calcutta, which in 1796 made a voyage from England to India with passengers, cargo and military recruits. The log lists a total of 126 in the crew and tells graphically the trials and tribulations of the early day sailing master. Those were the days when an infraction of the ship's laws meant a flogging on the quarter deck, and running throughout this chronicle is the poignant story of life at sea, the little dramatic incidents tersely jotted down by the ship's officers. When this vessel reached St. Helena, practically the entire crew deserted. They were hunted down man by man, put in irons, flogged, and then sent back to their work.

As a protection against pirates, the vessels in those days sailed in fleets, with a commodore who set the sailing orders for the entire fleet. There were times when the vessels would heave to at the command of the commodore, who would call the various commanders to his ship for a conference. All this is set down amid the trite observations on the weather and the detailed reports on sailing conditions.

Another of the more interesting logs was that of a U. S. naval vessel which in 1820 cruised the coastal waters of the United States in search of pirates. This brief notation entered into the log on August 14, 1820 tells the graphic story of early day sailing:

"At 9:00 a.m. discovered a sail on the weather beam, standing to the north at half past ten brought to quarter and clear for action. Hoisted the ensign, the stranger showing American colors at 10:50 spoker. She proved to be the U. S. brig Enterprise. Secured the guns and made sail."

Contained in this same log book is another entry worthy of mention. I



Date 24 July, 1901.

WEATHER REPORT FOR GREENWICH MEAN NOON FOR ONE DAY.

TIME OF OBSERVATION.	PORT OR POSITION.		WIND.		BAROMETER.		TEMPERATURE.			WEATHER
Ship's Time Corresponding to G. M. Noon.	Latitude.	Longitude. (Greenwich.)	True Direction.	Force 0-12.	As Read Off.	Att. Ther.	Air, Dry Bulb.	Air, Wet Bulb.	Water at Surface.	State of, by Symbols.
11h 49 am	56°6N	3°46W	N°	1	29.36	15	15	14	15	●

CLOUDS.			SEA.	
Forms of, by Symbols.	Moving from.	Amount, Scale 0 to 10.	State of, by Symbols.	True Direction from which coming
(A-S) hazy atmosphere		10	S	—

WEATHER EXPERIENCED DURING THE 24 HOURS PRECEDING THE OBSERVATION ON THIS PAGE:—

Fine Weather, light N.W. wind (2). At 8°30 am left for Copenhagen from Grangemouth Docks —

Current for the Day's run ...... knots.

Setting toward ......

At 7³⁰ pm this day, passed a Finback whale, say 30–40 feet long — Whale close to him he leapt clear out of the Water, so we could see under his flukes, four times he jumped up this way, and although I am an old Whaler & never did believe the stories about whales bridging right out clear of the Water, until now. I saw it now and my daughter took a Sketch of the Whale, while bridging; twice he turned his white Belly towards the Steamer, a very interesting sight.

Facsimile of both sides of a page from a steamer's log book.

is dated February 22, 1823 (Washington's birthday), and reads as follows:

“At sun rise the Constitution and Ontario fired a salute of 24 guns each, in honor of the day. At twelve the flag ship Ontario and the Dutch Admiral ship fired a salute of 24 guns.”

Six days later the American war ship reciprocated for this little courtesy on the part of the Dutchmen. The entry of February 28, 1823, reads as follows:

“Hoisted the Dutch flag at four and the American at the main in honor of the birthday of the Prince of Orange and in return for the civility shown us on the 22nd, at twelve the Constitution and the Ontario answered the salute of the Dutch Admiral.”

Most interesting of all is the personal log book of a Captain R. B. Forbes, who, in the spring of 1826, sailed from his home in Boston for China. Captain Forbes was a humorist and a philosopher, and interspersing the trite reports of weather and sailing conditions are bits of humor that would do credit to the highest paid writers of today. Captain Forbes' was not an easy voyage. He reached the mouth of the Wang Poo River in China only to find that he would be forbidden to enter. A fleet of Chinese junks stood by to see that Captain Forbes did not violate this command. He was permitted to send his supercargo to Canton to prosecute the ship's business, but was given only a limited time in which to remain in Chinese waters. Finally the captain had to sail without his supercargo.

The passage back toward South America was stormy and Captain Forbes' crew was beset with dysentery. After more than a 100 days at sea. the little vessel finally arrived off Buenos Aires.

More trouble was in store for the repid skipper and his crew. Brazil d Argentina were at war and the azilian navy had seized the port. cause Captain Forbes had refused show the Brazilian boarding offi- r his ship's papers, the brig was ken into custody, of which the cap- n writes:

“The brig who is in charge of us is so dull a sailor that I have concluded to make the best of our way without regard to any of them, as the precariousness of the weather and the dilatory disposition of the men of war's pilot may result in a delay. We have an officer on board who has orders to take our papers to the admiral, except in case of filling in with the Buenos Aires cruiser, in which case I am to take them directly. This I arranged with Captain Norton, that we might not by them be considered a price to the Brazilians, for if that was the case, they would make it a plea to take use in earnest. I humbly thank God that we were so fortunately delivered from wreck and pray that we may soon be delivered from the Philistines.”

Captain Forbes' brig was taken to Montevideo as a prisoner of war. He was allowed to go ashore but his first mate and members of his crew were detained aboard the ship. When the captain had completed his business and prepared to return to his vessel, he was not permitted to do so and for three days was held a virtual prisoner on land.

Irked by this detention, the captain decided to take matters into his own hands, of which he writes:

“I accordingly got into a shore boat and, on approaching the vessel, was ordered to stand off, but having a boat helm myself, I went alongside, when the crew endeavored to prevent my landing, but I jumped on deck where he stood before the companion, telling him to stand back. I, however, pushed forward and I succeeded in getting into the cabin without absolutely fighting. I then told the officer of my interview with the chief of marine, and told him if he did not go on shore immediately and report my having boarded by force that I would report it myself and likewise that he had allowed two others to go on board the same day. This silenced him immediately.”

Captain Forbes eventually won his controversy with the Brazilian authorities, was permitted to discharge his cargo and sail for Boston in September of 1827.

After several months ashore, the captain procured command of another vessel sailing to the Straits of Gibraltar, where he exchanged ships with the master, who was bound for China.

The last entry in this log book describes an accident aboard ship in which a seaman was thrown from the weather yard arm into the sea, striking the main brace as he fell. The captain described the accident in these words:

“It happened with singular fatality that nothing was at hand to throw over, not even a bucket or rope's end. The helm was put down immediately and the ship thrown back. A stove boat which happened to be lying on deck was launched with as much expedition as the confusion would permit and two men pulled to windward, but to no purpose, as he had disappeared some time. It was next to impossible to save him, as the ship was going with wind abeam with mainsail and top sail and the stove boat with only two men with difficulty got aboard again.”

Nickel in Modern Cast Irons

During the past two decades much work has been done by metallurgists and practical foundry executives on the improvement of cast irons. The role of nickel in these improvements was described and illustrated in an address by A. G. Zima, delivered before local chapters of the American Society for Metals at Roosevelt Hotel, Seattle, on February 9, and at Lloyd's Club House, Portland, on February 11. Mr. Zima is Pacific Coast field research representative of the International Nickel Company, Inc.

Following is an abstract of this interesting address:

It was not so many years ago that cast iron was listed in various tables and engineering handbooks as a material having a tensile strength of about 15,000 to 20,000 lbs. per square inch. Basing their calculations on these figures, engineers were obliged to design heavy, cumbersome equipment which, because of its weight or that of its component parts, resulted in low efficiency and limited applications.

Today specifications calling for tensile strengths of 50,000 to 60,000 lbs. per square inch are common, while several progressive foundries are producing machinable grey iron of even higher strengths.

Nickel uniformly hardens the matrix by changing pearlite to sorbite, troostite and martensite. It acts simultaneously as a hardener to the matrix and as a softener by eliminating carbides and precipitating graphite.

Where castings of irregular sections are involved, it is obviously impossible to fit an ordinary cast iron so that a ¼ inch section attains maximum density without an adjacent 1 inch or 2 inch thick portion becoming open grained. It is, however, possible to minimize this wide difference in structure by reducing the silicon content to a point where the heavy section attains the required density and then adding nickel to prevent the thin sections from becoming white, brittle and unmachinable. Pressure castings such as valves, pumps, compressor and engine castings are frequently alloyed with nickel in this manner to insure uniform density and pressure tightness. Gear blanks, couplings, pistons, pulleys, sprockets and other castings of non-uniform sections are likewise alloyed with nickel or nickel-chromium to bring about uniform hardness and machinability.

Nickel is used extensively for increasing the wear resistance of machinable castings. This improvement is due to the increased hardness which is obtained through the hardening of the matrix and also to the finer structure of nickel iron castings and their freedom from hard and brittle carbides.

The paper was illustrated with many photographs, charts and graphs. It discusses the improvement of cast iron with the addition of nickel for high strength, elastic modulus, abrasion resistance, resistance to growth and warpage at elevate temperatures and corrosion resistance. The highly alloyed cast irons such as Ni-Resist and Ni-Hard ar also described.

The Dividends of Safety

By Byron O. Pickard

Aristotle is credited with saying: "When a man doth think of a thing that is past he looketh down upon the ground; but when he thinketh of something that is to come he looketh up toward the heavens."

To compute the dividends of eleven years of expended effort in preventing accidents resulting in injuries to longshoremen and to seamen employed by Pacific Coast Shipowner and Waterfront Employer companies one must "stay down on earth." After all, we know more about the earth than we do about heaven.

When accident prevention was started on February 1, 1937, the Accident Prevention Bureau's program was based on the premise that acci dent prevention is a business; it i good business for both employer an employee and for the community a well; it is a business in which bot employer and employee win; there i no loser.

The Bureau has never propose anything in its program but wha was considered good business princ ples. Good business should dictat organization and efficiency; a defi ite plan for work with assignment c responsibility; a proper preparatio for each job; a proper selection bosses and assignment of fit perso nel; a proper instruction and di cipline of both bosses and personne

For American Deck Officers

(Continued from page 29)

ibly be pulled home after a while, ad it is best to "back" it with the stream anchor with fifteen to twenty thoms of good wire hawser between the bower anchor and the ring the stream anchor.

It is better to lay out the stream nchor first and to buoy the end of e wire, which can then be picked p later and secured to the ring of e bower anchor when that has een carried out, and before it is t go.

These anchors could, of course, be rried out together, but as a ream anchor is often fairly heavy would be too much for the average ship's lifeboats and would also ake a very heavy pull for the men the boats. The anchor can best e carried out between two of the hip's lifeboats, hung with a slip ope which can be readily cut, to a ood spar laid athwart the boats midships, and long enough to rest cross both gunwales of each boat. he spar should be securely lashed the boats so as to keep them apart convenient distance and to prevent heir closing together while the anhor is being hung in position. The ows and sterns of the boats should e lashed together to keep them parllel when being hauled out.

Before, however, doing anything ith the bower and stream anchors, he kedge anchor, with a 3-inch or a -inch manila hauling line attached, hould be laid out in the same direcon, but some little distance beyond he spot where it is purposed dropping the bower anchor, and the end f the hauling line brought back on oard and made fast. This line will hen serve for hauling the lifeboats ut to the proper spot for letting go he anchor, and also for getting them ack to the ship again, as, with a eavy bower anchor hanging between he boats and a quantity of wire hawer coiled down across them also, it is mpossible to either row or tow the oats, more especially if there is the east wind or tide; whereas with a arp, as described, four or five men can accomplish the work easily. The wire hawsers for the "ground tackle" should be securely bent together and flaked down across the two lifeboats, one end being made fast on board the steamer and the other end to the ring of the bower anchor between the boats. The wire can then be paid out as the boats are hauled out by the warp in the direction of the kedge. Before finally dropping the anchor, care must be taken to let go the after cross lashing holding the boats' sterns together, in order to allow the hawser to drop clear of it.

The anchors should, of course, be buoyed with heavy wire buoy ropes, if possible good enough to lift the anchors should necessity arise, and three or four small spar buoys should be attached at intervals along the hawser, so that in case of its carrying away at some point, during heaving, the ends can be quickly recovered by pulling up on the buoy ropes, and bent together again without loss of time.

● Blocks and Wire Hawsers.

Having laid out the anchor, it is not sufficient, especially if the holding ground be good, to merely heave on the wire hawser around the drum of the windlass, as this will not give nearly enough strain and, provided the purchase blocks are available, a heavy tackle should be rove off and one block attached to the hawser, the other secured at some point along the deck with a suitable lead, and with as long a scope as possible. By this means a heavy strain can be put on the hawser; in fact, considerably more than can be exerted by a really high-powered tug on an immovable object. The purchase will require overhauling from time to time if the ship moves or the anchor comes home a little, but this does not take long if a messenger is kept handy for bending onto the traveling block of the purchase and taken to a winch, instead of trying to overhaul the tackle by hand only.

If heavy purchase blocks are not available on board, a good impromptu purchase can be rigged with the heavy lead blocks or cargo blocks taken from the cargo derricks and placed side by side, each block forming one sheave of the purchase.

A steamer's wire hawsers are generally smothered with grease to prevent rusting, and it is therefore extremely difficult to attach the purchase block of the hawser so that it will not slip when the strain comes on it. Salvage vessels are provided with wire clamps and other patent

(Page 62, please)

Change of Masters

Steamer Chipana: William F. Hoyt; Vice, Paul Djurhuis.
Steamer Charles L. Wheeler Jr.: H. Danskannon; Vice, F. E. Conrad.
Steamer Point San Pedro: Gus Illig; Vice, Louis Prendle.
Steamer Maunalei: M. Gordenov; Vice, F. J. Hamma.
Steamer West Planter: Louis Prendle; Vice, H. Danskannon.
Steamer Wapama: Olaf H. Hansen; Vice, I. H. Halverson.
Steamer Hagan: George Eith; Vice, F. Englebracht.
Steamer Samoa: N. A. Sinnes; Vice, Olaf Hana.
Steamer Manukai; F. J. Hamma; Vice, K. Hubbenette.
Steamer Edwin B. Degolia: P. K. Countryman; Vice, R. B. Gallfry.
Steamer Curaca: Nils R. Richter; Vice, Ardin Thompson.
Steamer Admiral Y. S. Williams: F. L. Nystrom; Vice, C. J. Conway.
Steamer Carolinian: D. W. Hassell; Vice, Lester C. Hansen.
Steamer Mapele: W. J. Norberg; Vice, Frank M. Graham.
Steamer Golden Horn: Wm. H. Turnquist; Vice, W. R. O'Brien.
Steamer Panaman: J. A. Gaidsick; Vice, C. R. Khaury.

On the Ways - SHIPS IN THE MAKING

LATEST NEWS FROM AMERICAN SHIPYARDS

McCormick to Build New Steamers

On February 16 Charles L. Wheeler, executive vice-president of McCormick Steamship Company, returned to San Francisco from a trip to the Atlantic Coast and the Pacific Northwest, following discussions with the Maritime Commission and staff meetings with company personnel.

Wheeler received confirmation while en route to San Francisco that the Pacific Argentine Brazil Line, the subsidiary company operating to South America, had received an extension to May 1 of its temporary operating subsidy agreement.

This extension will give sufficient time for Commissioner Woodward's committee (which conducted hearings in San Francisco on February 3 and 4, and in other Pacific Coast cities) to report to the Commission as to the essentiality of the Pacific Argentine Brazil Line.

Wheeler attended the Woodward committee hearings in the Northwest. After preliminary perusal of evidence and testimony submitted, he stated the company is more assured than ever that the decision as to essentiality will be favorable, which fact the company never doubted.

The Pacific Argentine Brazil Line and McCormick Steamship Company greatly appreciate the thorough cooperation of port authorities, chambers of commerce, shippers, importers and exporters, junior chambers of commerce, Propeller Club, and hosts of other organizations that came to the aid of the one remaining Government - supported freight service on the Pacific Coast.

"Immediately after the decision on essentiality has been rendered," says Wheeler, "we believe that **the long-range program for new ships for the line will be promptly worked, and that the vessels will be constructed on the Pacific Coast. We have already requested Washington that this be done."**

Union Oil Contracts for Large Tanker

The Union Oil Company recently issued plans and specifications for a tanker to be of similar size, capacity and speed to the commercial tankers of approximately 13,000 tons deadweight such as the W. H. Berg of the Standard Oil Company of California.

Bids on this job were to be opened February 10. On that date was issued the following statement:

"Union Oil Company today placed the order for a new oil tankship, to be the largest and fastest in its entire fleet, with the Bethlehem Shipbuilding Corporation, Ltd., according to an announcement by W. L. Stewart, Jr., vice-president of the oil company.

"The new tanker will be built at

On January 29 Sun Shipbuilding & D
Dock Company at Chester, Pa., launched t
second of the two tankers for the Standa
Oil Company of California. She was chri
ened by Mrs. H. D. Collier for her husban
H. D. Collier, vice president of the Standa
Oil Company of California. The tanker w
delivered February 20, and is now on h
way to California. She is identical to t
W. H. Berg, described in our February issu

In April Pacific Marine Review will car
a full pictorial treatment of the tanker H
D. Collier.

B hlehem's Sparrows Point plant, n r Baltimore. Delivery of the ves- is scheduled to take place in ut 12 months. A. O. Pegg, Union's perintending engineer, will leave f Baltimore Saturday evening to pervise construction of the vessel.

'Union's new tanker will augment t oil company's domestic fleet, c sisting at present of ten capital s ps. It will be the first major ad- d ion to Union's fleet since 1922.

'The new tanker will be of 13,000 t s deadweight and will have a ca- p city of over 100,000 barrels of oil. S a speed will be twelve and one-half k ots. Overall length will be 463 f t, with a beam of 64 feet and a d pth of 34 feet, 10 inches. The tan- k r will have a draught of 28 feet, 4 inches.

"Oil-fired, triple expansion tur- nes, developing 3500 horsepower, ll drive the propeller of the single- rew vessel."

No figures on the bids were made blic.

ids on Fish Research Ship for California

One of the new construction jobs which some of the California ipyard estimating departments ve been busy is a fish research ssel for the California Fish and me Commission. This ship was de- gned by Geo. Wayland, naval ar- itect of San Francisco. Bids on r construction ranged as follows:

n Diego Marine Construction Co., San Diego:

Wooden hull,
Direct diesel drive $136,560
Wooden hull,
Diesel electric drive $176,890

arbor Boat Co., Terminal Island, Calif.:

Wooden hull,
Direct diesel drive $157,250
Wooden hull,
Diesel electric drive $185,000

ethlehem Shipbuilding Corpora- tion, Ltd.:

Steel riveted hull,
Direct diesel drive $261,000
Steel riveted hull,
Diesel electric drive $291,000

eneral Engineering & Dry Dock Co.:

Steel all welded hull,
Direct diesel drive $236,742
Steel all welded hull,
Diesel electric drive.... $254,345

No particulars of the design have been released for publication. We understand that all bids are in excess of the appropriation, and the Commission is trying to figure ways and means. If built, the ship will be the largest in the California State-owned fleet.

Trials of Largest Welded Ship, Tanker J. W. VanDyke

During the week of February 20 occurred the trial runs of the 18,500 ton tanker J. W. Van Dyke, built by Sun Shipbuilding and Dry Dock Company for the Atlantic Refining Company. On acceptance she will immediately go into service between Philadelphia and Texas-Gulf Ports.

In many ways this tanker is a notable product of American ship design:

First, she is the world's largest all welded ship.

Second, she is the first American-built tanker to be driven by steam turbine-electric propulsion.

Third, her boilers produce steam at a higher pressure than any heretofore installed in an American vessel.

Fourth, her cargo pumps are of the vertical shaft centrifugal deep well type driven by 2300 volt 300 horsepower explosion proof motors located on deck with the pump discharge surrounding the driving shaft, and no stuffing box in pump room. There are no wires or electric outlets in pump room, which is illuminated by vapor proof fixtures set in the deck.

Fifth, for the first time in an American tanker the windlass is electric-hydraulic drive, giving almost infinite speed variation and absolute control at any speed.

The J. W. Van Dyke has the following characteristics:

Length overall	541 ft. 5 ins.
Length B.P.	521 ft. 2 ins.
Beam	70 ft.
Depth	40 ft.
Draft loaded	29 ft. 6 ins.
Cargo capacity	156,000 barrels
Fuel oil capacity	9070 barrels
Displacement at load draft	23,898 tons
Propulsion motor	5000 H.P. 3 phase
Propeller speed	90 r.p.m., 60 cycle, 2300 volts
Sea speed	13.25
Steam pressure	650 pounds
Steam temperature	835° F.
Cargo oil pump capacity	15,000 barrels an hour

All engine room auxiliaries are operated by 440 volt alternating current motors.

The turbo electric propulsion is General Electric.

The steam generating plant consists of two Babcock and Wilcox water tube boilers, equipped with Bailey automatic combustion control, metering equipment, superheat control, and feed water regulators.

A New Dredge

Pusey and Jones of Wilmington, Delaware, report a new contract (Hull No. 1070) for a steel hull hopper dredge of 2,500 cubic yards capacity. She will be 308 feet 2 inches long overall, 300 feet between perpendiculars, 56 feet molded beam, and 29 feet molded depth. The dredge will be named Chester Harding.

Two Contracts for Moore Dry Dock Co.

The Moore Dry Dock Company of San Francisco and Oakland, California, have very recently received a contract to build a twin screw, welded steel hull, diesel propulsion shallow draft cargo vessel for Bay delivery service. This ship will be the largest of her type in service on California waters.

Moore Dry Dock have also been awarded a contract to build a gate caisson for the new graving dock at Mare Island, California.

Full particulars of both of these structures will be published in Pacific Marine Review as soon as they are officially available.

Building in American Yards

Pacific Coast

BETHLEHEM SHIPBUILDING CORPORATION, LTD.

(Union Plant)
San Francisco

NEW CONSTRUCTION: **Hull 5355—McCall (DD400).** Launched November 20, 1937; **completion date March 1, 1938. Hull 5356—Maury (DD401); launched February 14, 1938;** completion date June 1, 1938. Two 1500-ton destroyers for U. S. Navy; length, 341′ 3⅝″; beam, 35′ 6⅛″; depth, 19′ 8″. Cost $3,675,000.

DRYDOCK AND ROUTINE REPAIRS: **S. M. Spalding, Paul Luckenbach, Malolo, Hawaiian, Santa Elena, U.S. A.T. U. S. Grant, Atenas, Condor, D. G. Scofield, Caspar, French Str. San Diego, U.S.S. California, Absaroka, Chipana, U.S.S. Tennessee, M.S. Richlube, Hubert Schafer, Tulsagas, U.S.S. Oklahoma, J. C. Fitzsimmons, Makiki, Barge Utility, M. S. Havkong, Curaca, M.S. Limerick, President Coolidge.**

FELLOWS & STEWART, INC.

Wilmington, Calif.

NEW CONSTRUCTION: **Contract No. 663. 65 foot pleasure fishing boat for** charter. Main engine Fairbanks-Morse, with two Ford V8 conversions for auxiliary power. **Completed February, 1938.**

Contract No. 644, 65 foot combined passenger and party boat. Completion date May 1, 1938.

DRYDOCK AND ROUTINE REPAIRS: **W. T. Co. Blanche W., yacht Los Cerritos, yacht Astrild, purse seiner White Rose; 48 smaller yachts and commercial boats.**

GENERAL ENGINEERING & DRY DOCK CO.

Foot of Fifth Avenue
Oakland, Calif.

DRYDOCK AND ROUTINE REPAIRS: **Makua, Isthmian, Virginian, Ferry Issaquah, Genl. Frank M. Coxe, Gas. S. Excel II, Rose Marie, Tug Arabs, Siskiyou, Noyo, El Segundo.**

HARBOR BOAT BUILDING CO.

Berth 264, Fish Harbor
Terminal Island, Calif.

DRYDOCK AND ROUTINE REPAIRS: **Tuna Boats Cipango, Chicken of the Sea, Marico; Purse Seiners Long Island and New Limited.**

HONOLULU IRON WORKS

Honolulu, T. H.

DRYDOCK AND ROUTINE REPAIRS: **Chapaiev, Steel Age, Buffalo Bridge, Admiral Halsted, President Taft.**

LAKE WASHINGTON SHIPYARDS

Houghton, Wash.

DRYDOCK AND ROUTINE REPAIRS: **General W. S. Gorgas, M. S. Penguin.**

LOS ANGELES SHIPBUILDING & DRY DOCK CORP.

Los Angeles Harbor
San Pedro, Calif.

DRYDOCK AND ROUTINE REPAIRS: **La Placentia, Cathwood, Peter Helms, M.V. Kollgrim, Yacht Radio, West Planter, M.V. Silvermaple, M.V. Cape York, Brandywine, M.V. Silverbelle, California.**

MARE ISLAND NAVY YARD

Mare Island, Calif.

NEW CONSTRUCTION:

Sturgeon, Submarine (SS187); keel laid October 27, 1936; **estimated launching date March 15, 1938;** estimated delivery September, 1938.

Swordfish, Submarine (SS193); keel laid October 27, 1937; estimated delivery date August 1, 1939.

Order received for construction of two harbor tugs, YT 133 and YT 134, October 7, 1937.

Order received for construction of garbage lighter (YG21), dated February 8, 1938.

DRYDOCK AND ROUTINE REPAIRS: **Cincinnati, Concord, Rail, Sandpiper, Aylwin, Balch, Porter, Itasca, Holland, Wright.**

THE MOORE DRY DOCK CO.

Oakland, Calif.

DRYDOCK AND ROUTINE REPAIRS: **El Commodore, M/V Oakland, Richmond, Blue Water, Santa Monica, Brunswick, Elizabeth, Hercules, Norse King, Kadiak, Janidore, Kentuckian, Texan, Silvermaple, Santacruzcement, Isleton, Weser, San Vincenti, Carolinian, Kwang Yuen, Alaska Standard, W. A. Luckenbach, Columbian, Redwood, General Sherman, Redline, Point San Pablo, Hollywood, M/S Saparoea, Delawarian, Silverbelle, Manukai, Dakotan, Mathew Luckenbach, Hegiro, Margaret Schafer, M. H. Whittier, American; Purse Seiners Morning Star, McKinley, Crusader, Virginia II, Nordby, Roma.**

THE PUGET SOUND NAVY YARD

Bremerton, Washington

NEW CONSTRUCTION:

U.S.S. Wilson (Destroyer No. 408); standard displacement, 1500 tons; **keel** laid March 22, 1937.

U.S.S. Charles F. Hughes (Destroyer No. 428); standard displacement 1600 tons; order placed by Navy Department December 7, 1937.

DRYDOCK AND ROUTINE REPAIRS: **West Virginia, Astoria, Minneapolis, Haida.**

TODD SEATTLE DRY DOCKS, INC.

Harbor Island
Seattle, Wash.

DRYDOCK AND ROUTINE REPAIRS: **Alaska, Point Caleta, M.S. Aleutian Native, Jacob Luckenbach, Chilean Reefer, Condor, James Griffiths.**

WESTERN BOAT BUILDING CO., INC.

2505 East 11th Street
Tacoma, Wash.

NEW CONSTRUCTION:

Hull No. 130 Western Explorer, purse seine fishing vessel 81 x 20 x 9.5 ft.; powered by 200 H.P. Atlas 6 cylinder diesel. Keel laid October 10, 1937; **launched February 1, 1938.**

Hull No. 131, purse seine fishing boat, 78′ x 20′ x 9′; 200 H. P. Atlas engine.

DRYDOCK AND ROUTINE REPAIRS: **Fishing boats Over the Top and Empress.**

Atlantic, Lakes, Rivers

AMERICAN BRIDGE CO.

Pittsburgh, Pa.

NEW CONSTRUCTION: **10 carg barges** 132′ x 35′ x 10′ for Campbell Transportation Co., Pittsburgh, Pa.

THE AMERICAN SHIP BUILDING COMPANY

Cleveland, Ohio

NEW CONSTRUCTION: **Two bul lake freighters** 610′ x 60′ x 32′ 6″; 2,000 I.H.P. geared turbine, water tub boilers, 400 lbs. pressure, electric aux iliaries; for Pittsburgh Steamship Com py. Keels laid June 21, 1937; and J 6, 1937; launching dates Novemb 10 and December 2, 1937; delivery de April 15, 1938.

BATH IRON WORKS

Bath, Maine

NEW CONSTRUCTION: Hulls Nos. 1 . 162, and 163; **DD394 Sampson, D395 Davis** and **DD396 Jouett;** Three 1 0-ton destroyers for U.S. Navy; date o contract September 19, 1935. Eimated delivery dates June, August a October, 1938, respectively; launchn dates indefinite; **DD396,** keel laid, Mr. 26, 1936. **DD395,** keel laid July 2 1936. **DD394,** keel laid April 8, 16.

Hulls Nos. 170-171, DD409, Sims, a DD410, Hughes, two 1500-ton destyers for U. S. Navy; contract date Oober 12, 1936; keels laid July 15 a September 15, 1937, respectively; lanching dates, indefinite; delivery des April, 1939, and June, 1939, respctively.

Hulls Nos. 177 and 178, DD423 and D424, two 1620 ton destroyers for U. S Navy. Contract date September 30, 17; delivery dates April and June, 10, respectively.

BETHLEHEM SHIPBUILDING CORPORATION

Fore River Plant,

Quincy, Mass.

NEW CONSTRUCTION:

CV7, Wasp, Airplane Carrier for U.S. Gvernment; keel laid April 1, 1936; eimated delivery, November, 1938.

Hulls Nos. 1467, 1468, 1469, three psenger and freight steamers for Panaa Railroad S.S. Co.; 486 feet x 64 ft x 38 feet 6 inches; 16½ knot speed. Hels laid Nos. 1467 and 1468, Octob 25, 1937; No. 1469, November 15, 137.

Hulls Nos. 1470 and 1471, two 1500 t destroyers for U. S. Government; divery dates March, 1940 and May, 10.

BETHLEHEM SHIPBUILDING CORPORATION

Sparrows Point Plant

Sparrows Point, Md.

NEW CONSTRUCTION: **Two oil takers**—steam—425′x64′x34′ for Gulf C Corp.; total tonnage 7070 each; lnching dates October 9 and Decemb 11, 1937.

Four 13,000 deadweight ton steam tbine driven tankers for Standard Co. of N. J.; length 442′, beam 64′, pth 34′ 10″, gross tonnage 7,600, ed 12 knots. Esso Baton Rouge lnched November 13, 1937. R. W. llagher launched January 22, 1938.

One tanker for Texas Co.; about 000 deadweight tons; steam turbine.

BOSTON NAVY YARD

Boston, Mass.

NEW CONSTRUCTION:

DD402, Mayrant, and DD403, Trippe, o light destroyers for United States vy; LPB 334′; beam 35′6″; depth 19′ 8″; keels laid April 15, 1937; estimated delivery dates August, 1939 and October, 1939, respectively.

DD415, O'Brien, and DD416, Walke, two destroyers; LBP 341′, beam 36′, depth 19′8″; delivery dates indefinite.

DD425, Madison, and DD426, Lansdale, two destroyers; 341′0″ x 36′0″ x 19′8″.

One harbor tug for U. S. Navy; 98′0″ LBP x 24′0″ x 13′6″; delivery date indefinite.

BROOKLYN NAVY YARD

Brooklyn, N.Y.

NEW CONSTRUCTION:

CL 48, **Honolulu, light cruiser; L.B. P. 600′; beam 61′8″; standard displacement 10,000; geared turbine engines;** express type boilers; keel laid September 10, 1935; launched August 26, 1937; estimated delivery, August 1, 1938.

CL 50, **Helena,** light cruiser; L.B.P. 600′; beam 61′7¾″; standard displacement 10,000; geared turbine engines; express type boilers; keel laid December 9, 1936; launching date January 9, 1939; estimated delivery January 2, 1940.

BB 55, **North Carolina,** battleship; L.B.P. 714′ 0″; beam to outside armor 108′ 0″; std. displ. 35,000 tons; geared turbine engines; express type boilers. Keel laid October 27, 1937; estimated launching date May 1, 1940; contract delivery August 1, 1941.

CHARLESTON, S. C., NAVY YARD

Charleston, S.C.

NEW CONSTRUCTION:

Order placed for **one harbor tug;** LOA 124′ 9″, length between perpendiculars 117′, breadth, molded, 28′, depth, molded, 16′; keel laid August 2, 1937.

Order placed for **one harbor tug;** LOA 110′ 3″; LBP 98′ 0″; breadth 24′ 0″; depth at side amidships 13′ 6″. No dates set.

Order placed for one **harbor tug;** 65 feet long.

DEFOE BOAT & MOTOR WORKS

Bay City, Mich.

NEW CONSTRUCTION:

One diesel yacht, powered by 1,000 h.p. Winton engines; 143′ long, 23′ beam; steel construction. For Cox and Stevens, New York, N.Y. Delivery date **May** 1, 1938.

THE DRAVO CORPORATION

Engineering Works Division

Pittsburgh, Pa., and Wilmington, Del.

NEW CONSTRUCTION:

Hulls Nos. 1435-1439; five type W-4 welded steel coal barges 175′ x 26′ x 10′8″; for stock; 2360 gross tons.

Hulls Nos. 1440-1444; five type W-4 welded steel coal barges 175′ x 26′ x 10′8″; for stock; 2360 gross tons.

Hull No. 1448; one maneuver boat hull for U. S. Engineer Office, Louisville, Ky.; 73 gross tons.

Hulls Nos. 1449-1452; four welded steel oil barges 195′x35′x9′6″ for stock; 1956 gross tons.

This makes a total of 15 hulls with a total gross tonnage of 6749 tons.

ELECTRIC BOAT CORP.

Groton, Conn.

NEW CONSTRUCTION:

Hull No. 26, Salmon, SS182, standard displacement 1450 tons; keel laid April 15, 1936; launching date June 12, 1937; **delivery date March, 1938.**

Hull No. 27, Seal, SS183, standard displacement, 1450 tons; keel laid May 25, 1936 launched August 25, 1937; delivery date May, 1938.

Hull No. 28, Skipjack, SS184, standard displacement, 1450 tons; keel laid July 22, 1936; launching date October 23, 1937; delivery date July, 1938.

Hull No. 29, Sargo (SS188); keel laid May 12, 1937; delivery date June, 1939.

Hull No. 30, Saury (SS189); keel laid June 28, 1937; delivery date July, 1939.

Hull No. 31, Spearfish (SS190); keel laying date September 9, 1937; delivery date September, 1939.

Hull No. 33, Seadragon (SS194); 1450 tons; delivery date December, 1939.

Hull No. 34, Sealion (SS195); 1450 tons; delivery date February 1940.

THE FEDERAL SHIPBUILDING AND DRYDOCK COMPANY

Kearny, N. J.

NEW CONSTRUCTION:

One destroyer, **DD383 Warrington;** 1850 tons; keel laid October 10, 1935; launching date, May 15, 1937; **estimated delivery date February 8, 1938.**

Three destroyers, **DD397 Benham, DD398 Ellet and DD399 Lang,** estimated completion, April, June and August 1938; keels laid DD397, September 1, 1936; DD398, December 3, 1936; DD-399, April 5, 1937.

One 12,800-ton tanker for the **Standard Oil Company of New Jersey;** 450′ x 66′6″ x 34′6″; Isherwood Arcform design of hull form and longitudinal hull framing; keel laid August 16, 1937; **launching date March 19, 1938.**

Two destroyers, DD411 Anderson and DD412 Hammann; keels laid November 15, 1937 and January 17, 1938, respectively.

Hulls Nos. 149-150, two 12,900 ton tankers for Pan American Petroleum & Transport Co.; Isherwood Arcform design of hull form and longitudinal hull framing. Estimated completion date October, 1938. No. 149, keel laid November 15, 1937; No. 150, keel laid January 10, 1938.

Hulls Nos. 151, 152, and 153, three tankers for Standard Oil Co. of New Jersey.

JAKOBSON & PETERSON, INC.

Brooklyn, N.Y.

NEW CONSTRUCTION:

Hull No. 274, 84 foot all welded steel tug.

Hull No. 275, 70 foot auxiliary yawl.

Hull No. 276, 86 foot all welded steel tug.

MANITOWOC SHIP BUILDING CO., Manitowoc, Wis.

NEW CONSTRUCTION: **One** tanker for Socony-Vacuum Oil Company, Inc., New York; 1500 H.P.

THE MARYLAND DRYDOCK CO.

A Subsidiary of Koppers Company, Baltimore, Maryland

NEW CONSTRUCTION: **One double ended steel diesel ferry boat,** 208′ x 62′ x 9′, for the Claiborne-Annapolis Ferry Company; keel laid September 15, 1937; launched December 11, 1937; delivery date May, 1938.

THE NEW YORK SHIPBUILDING CORPORATION

Camden, N. J.

NEW CONSTRUCTION:

Three light cruisers; Hull No. 412, Savannah (CL42), Hull No. 413, Nashville (CL43), and **Hull No. 416 Phoenix (CL46)** of 10,000 tons each for the U.S. Navy Department; keels laid, 1935. **No. 412,** launched May 8, 1937; **No. 413** launched October 2, 1937.

One destroyer tender for U. S. Navy; order placed December 27, 1937.

One seaplane tender for U. S. Navy; order placed December 27, 1937.

NEWPORT NEWS SHIPBUILDING & DRYDOCK CO.

90 Broad Street, New York

NEW CONSTRUCTION:

H360 aircraft carrier, CV6, Enterprise, for U.S. Navy.; keel laid July 16, 1934; launched October 3, 1936; delivery date May, 1938.

H361, light cruiser, CL47, Boise, keel laid April 1, 1935; launched, December 3, 1936; delivery date July, 1938.

H362, light cruiser CL49, St. Louis; keel laid December 10, 1936; delivery date April, 1939.

Hulls Nos. 363-364, two destroyers, Nos. 413, Mustin, and 414 Russell; keels laid December, 1937; delivery dates April and June, 1939.

Hull No. 367, diesel electric tank vessel for Standard Oil Co. of New Jersey; length 260′6″; beam 43′6″; depth 18′3″. Keel laid September, 1937; launched December 8, 1937; **delivered February 8, 1938.**

Hull No. 369, twin screw mail, passenger and cargo liner for United States Lines Co.; length 723′, beam 92′, depth 45′.

Hulls Nos. 370, 371 and 372, three oil tankers for Standard Oil Company of New Jersey; gross tonnage about 11,600 tons; L.B.P. 525′; breadth molded 75′; depth molded 39′.

PHILADELPHIA NAVY YARD

Philadelphia, Pa.

NEW CONSTRUCTION:

CA45 Wichita, L.B.P. 600′, beam 61′ 9¾″, depth molded at side to main deck amidships 42′0⅜″, draft corresponding to normal displacement 21′ 10″; standard displacement 10,000; **estimated completion January 1, 1938.**

Order placed for **DD404,** 1500 ton destroyer; no dates set.

PORTSMOUTH N. H., NAVY YARD

Portsmouth, N. H.

NEW CONSTRUCTION:

SS185 Snapper, submarine; keel laid July 23, 1936; L.B.P. 300′, beam 26′, loaded draft 15′ 7″; launched August 24, 1937; commissioned December 15, 1937; **date of completion March 1, 1938.**

SS186 Stingray, submarine; keel laid October 1, 1936; L.B.P. 300′, beam 26′, loaded draft 15′7″; launched October 6, 1937; date of completion June 1, 1938.

SS191, Sculpin, submarine; contract period started December 1, 1936; L.B. P. 302′6″, beam 26′10″, loaded draft 16′8″; keel laid September 17, 1937; completion date June 1, 1939.

SS192, Squalus, submarine; contract period started December 1, 1936; L.B. P. 302′6″, beam 26′10″, loaded draft 16′8″; completion date August 1, 1939.

SS196, Searaven, submarine; completion date February 1, 1940.

SS197, Seawolf, submarine; completion date April 1, 1940.

THE PUSEY & JONES CORP.

Wilmington, Del.

NEW CONSTRUCTION:

Two single screw, steel freight steamers for the Philadelphia and Norfolk Steamship Co., Philadelphia, Pa. L. O. A. 292′, L.B.P. 280′, beam 48′6″, depth 32′ 3″, draft 18′; geared turbine drive 4000 S. H. P.; 2 water tube boilers. Delivery dates 12½ and 13½ months, respectively. Keel laid for first ship May 20, 1937; **launched February 15, 1938.**

Hull No. 1070, one steel hopper dredge, Chester Harding; 2,500 cubic yard capacity; length overall 308′2″, length B.P. 300′0″, breadth molded 56′ 0″, depth molded 29′0″.

SUN SHIPBUILDING AND DRY DOCK COMPANY

Chester, Pa.

NEW CONSTRUCTION:

Hull No. 167, one steam tanker for Standard Oil Company of California; 462′4″ x 65′ x 35′; 12,800 tons deadweight; launching date January 29, 1938; **delivery date February 20, 1938.**

Hull No. 168, One diesel tanker for stock account, equipped with Sun-Doxford engine; 542′5″ x 70′ x 40′; 18,360 D.W.T. Keel laid September 1, 1937; delivery date June 1, 1938.

Hull No. 169, one oil tanker (steam), 520′ x 70′ x 40′; for Atlantic Refining Co.; 18,500 tons; keel laying date October 11, 1937; delivery date, September, 1938.

Hull No. 170, one single screw steam tanker for Bernuth, Lembcke Co., Inc., New York; length 462′4″; beam molded 65′ 0″; depth molded 35′ 0″, DWT approximately 12,900 tons. Keel laid September 20, 1937; delivery date June, 1938.

Hull No. 171, one single screw steam tanker for Tide Water Associated Oil Co.; 462′ 4″ x 65′ x 35′; 12,900 dwt.; delivery date July 6, 1938.

Hulls Nos. 172, 173 and 174, three tankers for Standard Oil Co. of New Jersey; steam turbine; 525′ x 75′ x 39′; 16,300 dwt. Delivery dates April, 1939, November, 1939, and April, 1940, respectively.

UNITED SHIPYARDS, Inc.

Staten Island, N.Y.

NEW CONSTRUCTION:

Hulls Nos. 841 and 842; two ferry boats for City of New York; 267′ overall, 66′ extreme breadth, 19′9″ depth keels laid April 27 and May 1, 1936 respectively. 841 launched June 3 1937; 842 launched December 20 1937; **delivery dates February 15 and March 23, 1938,** respectively.

Hulls Nos. 851 and 852, two sludge vessels for City of New York, Department of Sanitation. Length on W. L 250′. Beam 43′6″, Depth 16′. Keel laying dates May 24 and July 22, 1937 respectively; launching dates January 4 and **February 1, 1938,** respectively **delivery dates February 4 and March 12, 1938 (estimated) respectively.**

Hull No. 856, fireboat for City o New York. Estimated keel laying dat April 5, 1938; estimated launchin date June 28, 1938; estimated deliver date August 20, 1938.

Inland Yard Holds Records for Launching

Dravo Corporation, specializing i the construction of inland waterwa and harbor vessels, with yards a Pittsburgh, Pa., and Wilmington Del., last year launched the secon greatest tonnage of vessels of an builder in the United States, including the builders of deep-sea vessels Although second in tonnage, Drav launched 95 vessels, a larger number of pieces than any other yar This gross tonnage was 41,728.

Dependable Insurance Since 1863

Fire · Automobile · Marine · Casualty · Fidelity · Surety

FIREMAN'S FUND GROUP
Fireman's Fund Insurance Company — Occidental Insurance Company
Home Fire & Marine Insurance Company
Fireman's Fund Indemnity Company — Occidental Indemnity Company

Strength Permanence Stability

New York · Chicago · SAN FRANCISCO · Boston · Atlanta

Marine Labor Problems

(Continued from Page 25)

of its most glaring weaknesses is found in the fact that the employer has no right to ask the Labor Relations Board to designate the unit with which he must deal.

● Wagner Act Needs Amendment.

The Act should be amended to give the employer as well as labor the right to ask for the determination of the proper collective bargaining unit. If the owners had had this right we would not have been subjected to the many months of needless confusion and controversy involved in the present jurisdictional fight between the A.F. of L. and C.I.O. longshore unions.

The Wagner Act also should be amended to prevent the intimidation of members of labor unions by union officials and various factions of union labor. The use of "beef squads" or "goonies," as they are called in the modern terminology of the front, and other forms of intimidation are matters of such common knowledge and public record that it is not necessary for me to elaborate upon this iniquitous practice.

Our British friends have met the situation by expressly providing that certain acts on the part of union labor shall be unlawful. Experience in England has proven that the elimination of racketeering and intimidation within the unions has not injured labor's cause. On the contrary, the labor movement in Great Britain today is stronger and firmer than the labor movement in the United States. The ability and high standing of British labor leaders indicate that restrictions upon intimidation have been beneficial to labor. The best interests of the labor movement in the United States demand that some legal curb be set up on such activities. In this connection it should be pointed out that under the present act the Labor Relations Board is not required to hold elections, but may determine the question of who shall represent the men by other evidence, often consisting of petitions designating one labor union or the other which have been circularized among the employees for their signature, under circumstances which constitute coercion of the most potent kind.

It would seem that the only way in which a true expression of the employees' opinions can be obtained is through a secret election in all cases where there is any possibility of controversy.

The act also should be amended to provide some penalty for the flagrant and open violation of labor contracts once they have been entered into. Sanctity of contracts is an absolute essential for successful collective bargaining, and any union which will not subscribe to this fundamental of honest dealing should be deprived of any standing before the National Labor Relations Board, and any benefits provided by the Wagner Act.

I would not have you believe that all of the union leaders with whom we deal take this attitude concerning their contracts. Unfortunately, however, the operation of our vessels is contingent upon performance of contracts with ten different maritime unions. If any one union refuses to perform its contract, our operations cease, and leaders of the remaining unions are as helpless as we are to battle with the situation.

● Railroad Mediation Recommended.

The Maritime Commission has recommended that jurisdiction of the Railroad Mediation Board be extended to the maritime industry. This matter is now pending before the Congress of the United States. A number of the maritime unions have stated their opposition to the measure on the ground that it is a limitation of their right to strike. In this connection I should like to point out that the contracts which these unions have voluntarily entered into now provide for mediation and amicable adjustment of disputes. A voluntary agreement on the part of the union to submit disputes to mediation or arbitration is necessarily a curtailment of the right to strike if it is lived up to. Fundamentally there should be no more objection to mediation by a government agency than there is to mediation through the

Marine Insurance in All Phases — "All Risks" . . . Inland Marine . . . Ocean Marine

STANDARD MARINE INSURANCE COMPANY, LIMITED
NATIONAL UNION FIRE INSURANCE COMPANY
MERCANTILE INSURANCE COMPANY OF AMERICA

GEO. E. BILLINGS CO.

Pacific Coast General Agents—Richard J. Lutich, Marine Manager

GArfield 3646
308 California St.
SAN FRANCISCO

TRinity 1521
Spreckels Bldg.
LOS ANGELES

SEneca 1478
Colman Bldg.
SEATTLE

MARINE DEPARTMENT
AETNA INSURANCE CO.
QUEEN INSURANCE CO.
MARITIME INSURANCE CO., LTD.
FIDELITY PHENIX FIRE INS. CO.
Commercial Hull Dept.
AUTOMOBILE INS. CO.

Mathews & Livingston

Marine Underwriters

200 BUSH ST. SAN FRANCISCO
Offices at: Colman Bldg. - Seattle 111 West 7th St. - Los Angeles

machinery provided for in our contracts.

● Hopeful Developments.

This picture of the present status of labor relations in the maritime industry on the Pacific Coast is not entirely a happy one. However, we have not abandoned all hope of achieving industrial stability under collective bargaining. We believe that the situation is one which calls for patience on behalf of both parties to our contracts, and we are encouraged by certain developments of the past six months which indicate that we may eventually find the answer to our troubles.

Among these developments may be mentioned the public interest in the problems of the merchant marine, and particularly its labor problems. The public has finally awakened to the fact that it is a third party to every labor contract, and eventually pays a large part of the enormous costs which result from labor disputes.

The following recent dispatch from Washington is evidence of a new attitude on the part of the government and the public:

"Critics of conditions created by labor laws enacted in 1932 and 1935 have felt the Government should move also to make labor more responsible for its actions and for observance of contracts. Business desire for such legislation has increased since enactment of the Wagner Labor Relations Act, partly because it is argued that the "unfair labor practices" specified in that act include only actions of employers and no action of labor is so defined.

"Secretary of Labor Frances Perkins proposed in 1936 that labor impose certain obligations on itself in recognition of responsibilities accompanying the advantages provided by the Wagner Act."

As a direct reflection of this public interest Congress has finally awakened to the necessity of dealing with the problem and is now struggling with various forms of remedial legislation.

The recent 98-day maritime strike on the Pacific Coast cost the parties directly concerned and the public between Three Hundred Million and Seven Hundred Million dollars. The total combined cost of the Hoover Dam, the great Golden Great Bridge and the Bay Bridge was only Two Hundred Sixty-Seven Million Dollars. It would have been possible to construct the Golden Gate Bridge with the losses incurred during two weeks of the recent tie-up.

Another hopeful sign is found in the fact that despite occasional tie-ups of our shipping, we have been able to reach agreement upon many items and to eliminate many causes of complaint. If we eliminate the stoppages of work which have arisen out of jurisdictional disputes between the unions, we find that there has been a decreasing number of interruptions of commerce. While our machinery for the settlement of disputes through port committees and the Labor Relations Board is not working perfectly, it has been useful in settling many so-called beefs. Unfortunately, the operators, the unions and the press have all become "waterfront-tie-up conscious." As result of the distressing experiences of the past few years, all parties are inclined to think in terms of tie-ups. At the first sign of trouble the newspaper headlines proclaim that another shipping tie-up is imminent.

The public never hears of the many disputes and controversies which are settled without tie-ups because these accomplishments have no particular news value. As an example of this attitude, I need only point out that on the occasion of the recent suspension of operations at Seattle certain labor leaders proclaimed from the house tops that the entire Pacific Coast was to be tied up. The actual fact was that there was not the remotest possibility of a Coast tie-up and none occurred. The same tactics are now being employed with respect to the controversy existing at San Pedro. Our only hope is that shippers and the public will soon learn to discount these cries of "Wolf! Wolf!"

(Page 56, Please)

Running Lights of Pacific Shipping

THOMAS G. PLANT, vice president of American-Hawaiian Steamship Company . . . born in New Jersey . . . joined A.-H. 31 years ago as assistant freight clerk on the American. Brought shoreside 2 years later and started upward climb, reaching position of operating manager in '23. Named vice president in '35. Established permanent waterfront employer associations. A yachting enthusiast, he has sailed often to the Islands in select racing competition. Lieutenant-commander in the U. S. Naval Reserve.

EDWARD H. HARMS, assistant operating manager, McCormick Steamship Company. Berkeley born . . . attended Berkeley Hi . . . thence to U. C., where he still occupies niche in Baseball Hall of Fame . . . crack pitcher during college years. Started lumber and steamship career with Nelson Line . . . to McCormick in '25. Marine committee Junior C. of C. President Propeller Club of California during '37. Secretary San Francisco Steamship Dinner last voyage. His loyalty, sincerity, born leadership will carry him to the top!

CAPTAIN A. F. PILLSBURY, of the firm of Pillsbury and Curtis . . . nationally recognized naval architects. A down-Easter, Capt. Pillsbury commanded sailing ships in the 'Round the Horn days. A marine-salvaging authority. He headed up the California Division of the U. S. Shipping Board during the Big Days. A true son of the sea, he enjoys panoramic view of the harbor from his skyscraper office in San Francisco. Lives in a veritable wonderland of flowers in the Berkeley hills.

HOWELL WARE, managing director of Xzit Pacific Company. Headquartered in San Francisco—where, incidentally, he has spent his entire business career—covers the whole seaboard from Puget Sound to San Diego. Formerly sales manager of Pacific Coast Glass Company (now Owens-Illinois), he joined up with Jack Govan, the Xzit president, two years ago, incorporating the Pacific Coast organization. Past president of Rotary . . . and San Francisco Sales Managers Association. An exceptional sailorman when he boats . . . a Culbertson disciple.

Propeller Club of California in New Snug Harbor

Members of the Propeller Club of California aboard to inspect the new moorings at 140 Battery Street in San Francisco (February 8) acclaimed the new location with grand enthusiasm.

We're right down town now in the heart of things marine. The food is quite superior—the tariff is easier—and there's a fine social atmosphere to the place which will encourage capacity attendances.

Thus it was . . . at the February 8 luncheon. Captain Walter H. Allen gave a most interesting outline of the construction plans for air and naval supply bases on San Francisco Bay.

Announcement is in the mails at this writing of the March 1 event. We will have the opportunity of "previewing" the Golden Gate International Exposition. Mr. Frederick Black of the exhibitors' division will bring us the story. We note that Monroe Paulsen is to be chairman of the day . . . and we'll be out strong to give him a hand!

"Entertainment Supreme" is also billed. Looks like we'd better come early.

President C. M. "Dad" Le Count is swinging into action with "full speed ahead." His objectives for the club in 1938 are meeting with great response . . . and his committee chairmen are right on the job. Fletcher Monson, for instance! The program group are building presentations well in advance . . . and, to let you in on a secret, there's exciting talk about a Spring Jinks already in the air.

L. L. Westling has been named chairman of the very important Legislative Committee . . . a responsible post which he is well fitted to conduct. His aides will soon be announced.

Herman D. Nichols, Tubbs Cordage Company executive, elected to the 1938 governing board of the Propeller Club of California.

Steel Men Appointed

Two recent appointments we have to record are those of G. Reed Schreiner as advertising manager of Carnegie-Illinois Steel Corporation; and Charles R. Moffatt as director of advertising, under C. V. McKaig, vice president, of the United States Steel Corporation of Delaware.

Schreiner, who has been assistant advertising manager of Carnegie-Illinois since organization of the company on October 1, 1935, succeeds Moffatt. He was born in Pittsburgh on June 16, 1895, and received his A. B. degree at the University of Pittsburgh in 1916. Following World War service with the United States Army, he entered the advertising department of the former Carnegie Steel Company in January, 1919, and has served continuously with that department of the United States Steel Corporation subsidiary.

Moffatt has been advertising manager of Carnegie-Illinois Steel Corporation since the organization of that company, and director of exhibits of United States Steel Corporation since July 1, 1935.

He moves into his new position after 31 years of service with subsidiary companies, beginning in 1907 in the accounting department of the Illinois Steel Company at Chicago. He assumed charge of sales statistics and advertising of that company in 1919, and remained in that position until his 1935 appointments.

The new office of United States Steel Corp., combining advertising and exhibit activities, will be located at 436 Seventh Avenue, Pittsburgh.

Todd Official is Mourned

William H. Raab of Bronxville, N. Y., died suddenly recently while on his way to the offices of the Todd Shipyards Corporation, with whom he had been associated for the past thirty-one years. He was seventy-seven years of age and is survived by his widow, Mrs. Bertha Raab, and two daughters, Mrs. Charles Weber of New York and Mrs. Ivan Kittelsen of Brooklyn.

Raab was born in London on October 15, 1860. Upon reaching the age of seventeen he answered the call to sea by becoming engineer's mess-boy in the employ of the General Steam Navigation Company running out of London. After serving at this job for three years, he became associated with the Red Star Line as an oiler. Shortly after this he was promoted to the position of junior engineer on the S. S. Waesland. In 1887 he left the Red Star Line t become an employee of the Mors Iron Works in Brooklyn, where h was soon made superintendent, an continued in that capacity until 1902 at which time he left the compan to enter into business for himsel organizing the Raab Iron Work which he sold in 1907 to go with th Robins Dry Dock & Repair Compan now a subsidiary of the Todd Shi yards Corporation.

FULTEC *Marine* FINISHES

Ventilator Colors...Hull Finishes ...Copper Paints...Bottom Paints ...Boot-Topping

Into these synthetic finishes go the technical and scientific knowledge of the paint chemist and the latest, highest-quality synthetic pigments, gums and resins. Produced by W. P. Fuller & Co. . . . since 1849.

DOLLAR STEAMSHIP LINES

EXPRESS FREIGHT-PASSENGER AND REFRIGERATOR SERVICES

ROUND-THE-WORLD

ATLANTIC-FAR EAST TRANS-PACIFIC

INTERCOASTAL MEDITERRANEAN - U. S. A.

Dollar Steamship Lines Inc., Ltd.

ROBERT DOLLAR BLDG., SAN FRANCISCO - DOuglas 6000

OFFICES & AGENCIES THROUGHOUT THE WORLD

BOSTON
CHICAGO
CLEVELAND
DETROIT
LOS ANGELES

SEATTLE
NEW YORK
PORTLAND, ORE.
WASHINGTON, D.C.

Bilgers will Banquet

Ahoy, Bilgers! says the announcement of the Bilge Club . . . the sailing orders for the 10th Annual Banquet.

The "destination": Biltmore Hotel in L. A.

The cargo: Dry and liquid. Entertainment and good fellowship.

The freight: 5 simoleons (weight or measurement).

The time: March 19.

The agent: J. J. Buntin at Terminal Island.

● **McCormick Steamship Company**

The McCormick Steamship Company announces that it will resume its regular coastwise schedule of two sailings per week between California and Columbia River. Northbound sailings will be from San Francisco on Wednesdays and Saturdays (Oakland one day prior). Southbound sailings from Portland will be on Wednesdays and Saturdays. The Wednesday sailing is direct to Los Angeles Harbor and the Saturday sailing to San Francisco Bay ports thence Los Angeles Harbor. Northbound sailings from Los Angeles Harbor will be on Wednesdays and Saturdays.

Improved conditions in the coastwise trade have made this increased service possible.

Book Review

Rudolph Diesel and Burmeister & Wain, by Johannes Lehmann; a 150-page book with art paper covers profusely illustrated. Published by Burmeister & Wain of Copenhagen to celebrate the 40th anniversary, January 28, 1938, of their original contract with Rudolph Diesel for the Danish rights to manufacture under his patents.

This is a beautiful tribute to the genius of Rudolph Diesel, and a comprehensive history of the development of his revolutionary engine and of the development of the firm most responsible for the introduction of that engine to marine propulsion.

ABOARD THE "MERIMAC"

Roland E. McCune and John B. Merifeld at their San Francisco offices, 344 Sacramento Street. Here is built as part of their display room an ultra-modern cruiser, wheelhouse and after deck, making one of the most novel marine equipment manufacturers "moorings" in America.

This very interesting, very beautiful, and very worth-while book covers its subject completely and attractively and gives the reader a very real sense of the tremendous difficulties involved in selling Diesel's idea to the industrial and marine world.

Burmeister & Wain's contract reserved to themselves the right to patent and control their own improvements. Under this contract they developed the first successful marine diesels in large sizes, and their type of engine is now afloat in a very large percentage of the world's seagoing motorships.

Trade Booklet

Yarway Impulse Steam Trap, Bulletin T-1733 of the Yarnall-Waring Company, Philadelphia. This 12-page booklet gives complete information on the Yarway Trap and its application on steam heating equipment. Tables show suitable sizes of trap for draining steam mains, pipe coils, dryers and heaters. Many industrial, culinary, and special applications are illustrated by diagrams showing piping and fittings required.

Tanker Data

In 1936, 87 tankers were launched. of 667,794 gross tons, while last year 96 were put in the water, of 769,744 gross tons register. As American built takers are so small a factor in foreign trade the 20 American tankers launched can be deducted from my calculations, leaving 76 vessels, of 626,090 gross tons

During 1937 it is estimated tha the increased production of oil wa 30,000,000 tons. Assuming that hal of it is to be water-borne, the new tankers added to the world's flee would not take care of this increase

In any case, taking into considera tion the tankers which should b considered obsolete, there is no likely to be any reduction in off shore tanker freights during th year.

The most potent bulwark ever raised against scale and corrosion in the battle for efficient and economical marine boiler operation—

The HALL MARK signals victory for shipowners thus protected!

Today 224 vessels have eliminated mechanical boiler cleaning expense because their owners realize the value of the HALL SYSTEM OF BOILER WATER CONDITIONING.

The Hall Laboratories has earned the confidence and respect of every shipowner it is serving.

Bull & Roberts
117 Liberty Street
New York

Hall Laboratories, Inc.
981 Folsom Street
Phone GArfield 7027
San Francisco

Hagan Corporation
Bowman Building
Pittsburgh, Pa.

Ready!

t all Pacific Ports

EDERAL PAINT and FEDERAL SERVICE

for Tankers
Ocean Going Freighters
Intercoastal Passenger
Liners
Sailing Vessels
Ferryboats
Trans-Pacific Express
Steamships
Pleasure Craft
Work Boats
Schooners

The Federal Composition & Paint Co., Inc.
33 Rector Street, New York, N.Y.

ON THE PACIFIC COAST:

SEATTLE, WASHINGTON
A. T. B. Shiels
108 West Lee Street

PORTLAND, OREGON
Chalmers Shipping Co.
Board of Trade Building

SAN FRANCISCO, CALIF.
Pillsbury & Curtis
310 Sansome St. KEarny 3302-3

SAN PEDRO, CALIF.
Robert S. Gardner
P. O. Box "C"

Agents and Stocks in all the Principal Ports

Names and News

Francis R. Hart

In Boston recently Francis Russell Hart, president of the United Fruit Company for the past five years, passed away at the age of sixty-nine. His paramount interest was with the tropics, his administration of the United Fruit Company covering a period in which its fruit-growing activities and its steamship service were noted by their successful operation. He was a member of a number of societies and clubs, and the author of several books on the countries of the Caribbean.

Malcolm A. Rogers

Formerly manager of the insurance and claims department of W. R. Grace & Co., Malcolm A. Rogers has resigned to open his own insurance brokerage offices at 433 California Street. He was identified with Grace for over 13 years and is widely known in steamship and marine circles.

M. A. Cremer

Announcement has been made of the appointment of M. A. Cremer to take charge of the trade development department of the General Steamship Corporation, Ltd., with headquarters in San Francisco. This department was organized in 1926 and has proved useful to importers and exporters who wish the assistance of the company in making connections through its network of agencies in all parts of the world.

Cremer has had extensive work in foreign trade, thus bringing to his new post valuable knowledge in this field.

Victor A. Link

When the Panama Pacific liner Virginia docked in San Francisco recently, Victor A. Link, chief engineer, announced that he was going to be married in the near future to Miss Helen Stryke, of Ridgewood, N. J. Miss Stryke is a graduate of Trinity College, Washington, D. C., and is a member of several societies.

Paul D. Chandler

In Los Angeles recently Paul D. Chandler passed away unexpectedly at the age of 66 years. He was well known on the Pacific Coast, especially among the shipping fraternity, and was manager of the marine department of the Los Angeles Chamber of Commerce at the time of his death, a position he had held for several years.

During the World War Chandler was a captain in the Navy, later coming to San Francisco to become associated with the Luckenbach Steamship Company, after which he became district manager for the company in Los Angeles, was transferred to Seattle in the same capacity, then resigned to join the Los Angeles Chamber of Commerce.

Interocean's Los Angeles Staff Increased

Recent announcement from Walter Wilkinson, district manager at Los Angeles for Interocean Steamship Corporation, states that a promotion and two additions have been made in the personnel in that city:

W. J. Sweeney was promoted to traffic manager after several years of service as assistant traffic manager: H. R. McLaurin, a veteran Los Angeles shipping man recently identified with the Grace Line, has been added to the staff as district freight agent, where he will work with A. C. Appel on the Weyerhaeuser Pacific Coast Direct Line intercoastal service; and Mrs. P. M. Sweet, once connected with the Dimon Line and for the past several years in the offshore department of Grace Line, was added to the secretarial staff.

Samuel Zemurray

Samuel Zemurray, for the last five years managing director of the United Fruit Company, has had a remarkable and successful career. Coming to this country when eleven years of age, he drifted into Mobile and laid the foundation of his fortune by buying ripe bananas from discharged cargoes and selling them to small dealers who could quickly dispose of them. Later he enlarged his efforts, went to New Orleans, contracted with the United Fruit Company for their "ripes" and built up a small business by shipping the fruit up country. Still later he formed a two-man partnership, a

Photo by Blank & Stoller, New York

Samuel Zemurray, President, United Fru
Company, One Federal Street, Boston.

small steamship was purchased an cargoes of bananas, bought froi growers in Honduras, were unloade at New Orleans. And the busines continued to grow. In 1910 Zemu ray formed the Cuyamel Fruit Con pany. For some time before tha while he continued to buy fruit, l had started his own banana farn and had a field force capable growing exceptionally fine fru When it is remembered that the fir bananas, wrapped in tinfoil, we sold for a dime each at the Cente nial exhibition in Philadelphia 1876 and were thought to be a no elty, and twenty-five years later f teen companies were exporting t fruit into this country, it can be u derstood that the banana had arriv and was by way of becoming popul

Mackay Radio

The Marine Department of M kay Radio and Telegraph Compa has moved from its former quart at 33 South William Street to third floor of the International Te phone Building at 67 Broad Str in which other headquarters offi of Mackay Radio in New York situated. According to H. L. Rodm general manager of Mackay Rad Atlantic Division, this move to lar space has been necessitated by company's rapidly expanding acti in the marine field on the East C under its new marine superint dent, W. V. Russ.

HOTEL PHILADELPHIAN

Highly recommended by experienced travelers the world over for its warm hospitality; its excellent cuisine served in comfortably Air-Conditioned Restaurants; its convenient location to the business section; and its unlimited parking facilities.

600 ROOMS with bath from $2.75 up

DANIEL CRAWFORD, JR.
MANAGER

39TH AND CHESTNUT STREETS
PHILADELPHIA, PA.

..THE..

"Arcform" Ships at Sea

These vessels have proved themselves in actual performance t most efficient and economical ships of their class in operation today.

The Masters and Officers of the three "Arcform" cargo vessels at sea report their behaviour is consistently EXCELLENT and especially so IN BAD WEATHER.

The Steel Hatches fitted in these vessels have given the utmost satisfaction and are unquestionably an additional source of safety against foundering.

Sir Joseph W. Isherwood & Co., Ltd.

4 Lloyd's Avenue
London : E.C.3

New York : U.S.A.
17 Battery Place

BERRY E. DUNN

Representing . . .

KEARFOTT ENGINEERING CO., Inc.
Kearfott Windows

LOCKWOOD-CARLISLE
Piston Rings Carried in Stock

20 MARKET STREET SAN FRANCISCO

Galley Floor Safety
on the "Queen Mary"...

Alundum Aggregate in Terrazzo

THE latest in design—the latest in materials—that's the keynote of the "Queen Mary." So the builders selected a modern material for the galley floors—Alundum Aggregate in terrazzo. This combination gives a surface that is permanently non-slip—wet or dry.

This non-slip terrazzo flooring was used for other places, too, aboard this great Cunard-White Star vessel—places used by passengers and crew.

Write for Catalog C which gives full information about Alundum Aggregate for terrazzo.

If you prefer tile there are Alundum Floor Tile and Alundum Ceramic Mosaic Tile—two other Norton Floors products that are effectively non-slip even when wet—described in Catalogs A and B respectively.

NORTON COMPANY, WORCESTER, MASS.

New York Chicago Detroit Philadelphia Pittsburgh
Hartford Cleveland Hamilton, Ont. London Paris
Wesseling, Germany Corsico, Italy

T-45A

NORTON FLOORS
ALUNDUM TILES—TREADS—AGGREGATES

Marine Labor Problems

(Continued from Page 48)

As a matter of fact, there is less reason for shipping tie-ups because of labor troubles on the Pacific Coast at the present time than at any time in the history of the maritime industry. There are no existing disputes over the fundamental issues which have caused trouble in the past. Wages are high, working conditions generally have improved, the unions have their hiring halls and, as already pointed out, agreements have been reached upon many items which in the past have provoked controversy.

Most important of all is the fact that the individual longshoreman wants to work and is pretty well fed up on stoppages of work arising out of causes entirely beyond the control of the shipowner and outside the scope of his direct relationship to his employer. Many longshoremen are asking why employees should pay union dues and special assessments to be used for fighting other employees, or why they should interrupt their employment to satisfy the personal ambitions and political aspirations of individual leaders.

● Relief Allowances To Strikers.

It is true that if the individual longshoremen would walk out they would probably receive relief allowances. The irony of the situation is that these allowances would be paid out of public taxes, including those paid by the shipowners. But the men have learned from bitter experience that there is a great difference between relief allowances and their average earnings of $208.00 per month. This attitude of the rank and file of the longshoremen was clearly demonstrated last April, when the owners found it necessary to suspend relations because of almost daily tie-ups of ships over jurisdictional disputes entirely beyond their control. The longshoremen made it very evident to their leaders on that occasion that they had no sympathy with the frequent tie-ups and interference with their work.

Within a few hours after the port was closed and because of rank and file pressure, the union leaders quickly changed their tactics and gave the shipowners the following written acknowledgment of the injustice of these stoppages of work and assurance of their discontinuance. This was given because in the vernacular of the waterfront the rank and file of the longshoremen "put the heat on their own leaders."

"March 25, 1937.

"To San Francisco Waterfront Employers Association:

"Gentlemen:

"The I. L. A. Pacific Coast District recognizes the fact the jurisdictional disputes between the various maritime unions and other disputes that are now occurring, involving issues beyond the terms of our contract, are working an unnecessary hardship on the employers through strikes, stoppages of work, etc.

"The I. L. A. Pacific Coast District hereby assures the employers, parties to the 1936 agreement as amended, that such disputes as herein described will not be recognized or supported by the membership of the I.L.A. by indulging in illegal strikes or stoppages of work.

(Signed)
H. R. Bridges
Henry Schmidt
Con Negstad
A. Whitehead
Lee Gholson
Ed Krumnolz."

The most encouraging factor in our present picture is the evidence that the potent element of self-interest has at last begun to assert itself in this picture. The employers have realized for a long time that shipping suffers tremendously from the mere threat of labor trouble, and the unions are finally awakening to the fact that their own self-interest calls for discipline in their ranks and for the elimination of stoppages of work.

The employees are finally learning that the same goose that lays our golden eggs also lays theirs. Frankly, she has not been doing so well by either the shipowners or the employees lately.

A striking example of the effectiveness of self-interest in this situation is found in a bulletin recently issued by the Sailors' Union of the Pacific.

"Prior to 1934 strike, conditions so far as seamen were concerned, were lousy on this coast. In order to get a job, you had to hang around a filthy fink hall for months at a time. If you kicked about conditions you were fired and the finger was on you; you could not sail; you were blacklisted because you fought for conditions; you were sailing for wages from $35.00 to $50.00 per month and no overtime, AND THE SHIPOWNERS MADE YOU LIKE IT! They had you down.

"Today, after continually fighting for more than three years against al sorts of odds, we have:

1. Absolute control of shippin through our own union halls.
2. No more blacklisting! The Sai ors' Union of the Pacific is backin you 100% against discrimination.
3. You've doubled your wages an regulated your working hours, an you get cash for all overtime earne

Are we going to lose the freedo and the gains we have made throug phony actions of a few?

Are we going to be forced by reg mentation into government-contro led fink halls, because of the actio of this same "few"?

There are a lot of guys today pac ing a union book who think that th book gives them the right to perfo any time they want to; to tie ships on phony beefs in foreign po and on the East Coast; to knock and go on a drunk during worki hours; to delay the sailing of shi through drunkenness ashore.

Some of these performers ju started to go to sea during the la year or two. They didn't have to through the misery and the fighti which was the lot of the West Co seamen. Everything had been d for them before they started go to sea. And yet, the big majority

903 FIFE BLDG.
1 DRUMM ST.

THOMAS A. SHORT

Successor to

C. V. LANE

Marine Representative:
Thos. A. Short,
1 Drumm Street, San Francisco

HYDE STEERING GEARS
HYDE WINCHES
HYDE WINDLASSES
HYDE CAPSTANS
HYDE MANGANESE BRONZE PROPELLERS & CASTINGS
A. B. SANDS & SON CO., PLUMBING FIXTURES
SMOLENSKY NOISELESS CHECK VALVES
BACHARACH INDUSTRIAL INSTRUMENT COMPANY
DIEHL MFG. CO. FANS, MOTORS, GENERATORS
SUBMARINE SIGNAL COMPANY FATHOMETER
COLORED CRAYONS
METAL WORKERS' CRAYONS
WELIN QUADRANT AND SHEATH SCREW DAVITS
MACLACHLAN GRAVITY DAVITS
LIFEBOAT WINCHES
METALLIC LIFEBOATS AND LIFERAFTS
SHORT OIL SEPARATOR
WILLIAM W. NUGENT & CO., OIL FILTERS
U. S. METALLIC PACKING
CONSOL RUST REMOVER
CONSOL RED and BLACK
HASKELITE—PHEMALOID
PLYMETL ORNAMENTAL PANELS

B. F. GOODRICH CUTLESS RUBBER BEARINGS

MEEHANITE CASTINGS—PISTON RING STOCK, BURNER CONES, ETC. R. P. ADAMS POROUS FILTERS

SHORT OIL DETECTING SERVICE FOR PROTECTING BOILER FEED WATER AND FUEL OIL HEATERS

Hyde Windlass Company

Steering Gears, Windlasses, Capstans, Bronze Propellers —as installed on America's finest ships.

Bath, Maine

Pacific Coast Representative:
Thos. A. Short, 1 Drumm Street, San Francisco

Inter-Coastal Paint Corporation

SAN LEANDRO, CALIFORNIA

Originators and sole manufacturers of CONSOL both plain and in colors. A conditioning solution for metal surfaces that have become corroded. Not only a scale remover but a preservative as well. Gives excellent results when applied to boottop belt, hull, holds, bilges, tank tops, chain lockers, ventilator trunks, decks and so forth. Is non-inflammable and contains no acids or chemicals that are injurious to men or metal.

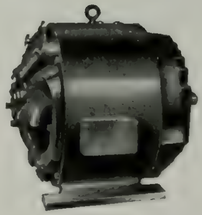
Marine Representative
Thos. A. Short, 1 Drumm Street, San Francisco

Marine Motors, Generators and Ventilating Equipment

DIEHL MANUFACTURING COMPANY

Electrical Division of
THE SINGER MANUFACTURING CO.
Elizabethport, New Jersey

San Francisco Representatives:
MARINE ELECTRIC CO.
Desk and Wall Fans
THOMAS A. SHORT
Motors, Generators, etc.



PLYMETL *fireproof* PANELS

Plymetl bulkheads, as installed on the "R. P. sor" and "T. C. McCobb," meet the latest quirements of the N.F.P.A. for fire resistance. e qualities listed below are available ONLY in ymetl:

- ●Fire Resistance
- ●Lightness
- ●Ability to take fine finishes
- ●Sound Deadening
- ●Heat Insulating
- ●Strength

Pacific Coast Representative:
OMAS A. SHORT, 1 Drumm Street, San Francisco

HASKELITE MANUFACTURING CORPORATION . . 208 W. Washington St., Chicago, Ill.

the trouble in the ships originates with these Johnnie-come-latelies.

The membership of the Sailors' Union of the Pacific will not stand for any more of these irresponsible actions.

They do not want their union wrecked by these bum beefs.

They do not want government fink halls back on this coast."

This bulletin constitutes a frank admission by the union of lack of discipline on the part of individual members, of illegal stoppages of work, and of failures to adjust grievances in accordance with the terms of the contract. It then goes on to point out that these irresponsible actions on the part of individual members of the union are greatly to the detriment of the union itself, and unless curtailed will result in the loss of certain prerogatives and rights which the union holds most dear, particularly the right to have men dispatched to the ships through a hiring hall.

There has been a great deal of comment in the public press concerning lack of discipline on American ships. The Commission's findings and comments on this subject are a matter of public record. Those findings have been criticized by union labor leaders. I shall not discuss the subject at length, but I am glad to introduce this bit of evidence from an official union publication. It indicates that there are certain labor leaders who are wise enough to realize that the abuses referred to in this bulletin are against the best interests of labor itself and who are courageous enough and smart enough to insist on the correction of such abuses through union action.

● Accident Prevention Work.

One constructive program which the Pacific Coast shipowners have been carrying on has received little attention from the public. I refer to the pioneer work of the shipowners of the Pacific Coast in the field of the prevention of accidents in the maritime industry, which has been carried on under the direction of the Accident Prevention Bureau of the Pacific Coast Marine Associations. At the present time Pacific Coast operators are expending a sum in excess of Fifty Thousand Dollars a year in the prevention of accidents through inspection and adoption of safety measures. The constructive value of this service has been recognized by Jewell W. Swofford, Chairman, U.S. Employees' Compensation Commission, in a recent report in which she says:

"The Accident Prevention Bureau organized by Marine Associations on the Pacific Coast furnishes an example of successful cooperative effort in formulating and administering a voluntary safety code for the prevention of accidents in maritime employments. The form of organization and the methods of enforcement that have operated there with such marked success appear equally appropriate for other sections of the country. It requires only the sincere desire of employers and their willingness to cooperate with one another to make similar associations equally effective in other localities."

In conclusion, may I repeat that so far as Pacific Coast maritime industry is concerned, we have made tremendous progress in the field of organization and the execution of contracts. The contracts provide that all grievances shall be adjusted by joint committees of employers and employees and that in the event of disagreement, the issues shall be settled by arbitration.

If these contracts are observed by both parties thereto, there is absolutely no excuse for stoppages of work on this Coast. All that is required to make this kind of an arrangement work is good old fashioned honesty on the part of both sides. There is no reason why the ordinary rules of integrity should not apply as much to a labor contract as any contract, and I am convinced that all parties to these contracts eventually will learn that it is to their own interest to take this attitude.

When all parties to our maritime contracts will subscribe to the principle of sanctity of contract without reservations, and not until then, can we expect stable labor relations in the maritime industry.

I can assure you that the organized employers of maritime labor on the Pacific Coast subscribe to this principle and are making an honest effort to solve their labor difficulties through the process of collective bargaining.

Welded Steel Fishboat Hulls

The all-welded steel hull of the Paramount, largest purse-seine fishing boat in the world, allows her to carry 30 per cent more fish than she could if her hull were of wooden construction. Although the construction expense of this welded hull was approximately one-third higher than that of a wooden hull, insurance rates are more than cut in half, and maintenance costs are greatly lowered. On the basis of operating economies thus gained, the new steel hull is estimated by its owners as being capable of paying for itself in two years.

The Lake Washington Shipyards, Houghton, Washington, used six tons of General Electric W20 electrode in fabricating the hull of the 121-feet-long, 30 - feet - wide vessel. Upon completion, the Paramount was immediately sold to Frank Mosick, Bernard Carr, and Associates, for tuna fishing out of San Pedro, Calif. Her capacity for carrying fish in brine (net weight of fish, 330 tons) is the largest among Pacific fishboats.

Trade Literature

The Cunningham Whistle, a beautiful 10-page booklet in black and bronze, issued by Doran Company, Seattle, Washington.

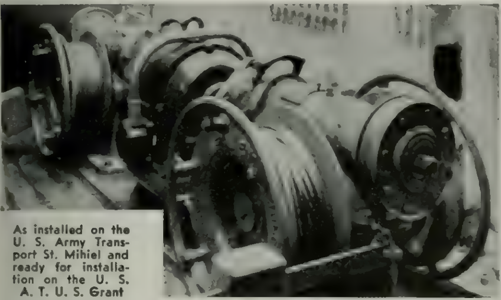
This brochure describes the various types of the famous Cunningham pneumatic whistle, for which it claims a "greater range and volume of sound on a smaller expenditure of energy than any other whistle ever made."

This whistle is made in various sizes and combinations for control either by mechanically operated or electric solenoid operated valve.

Sizes range from whistles suitable for a small cruiser to those required on the largest liners.

THE Genco POWER AND HAND WINCH

. . . for launching life boats aboard your ships *will more than meet requirements*



As installed on the U. S. Army Transport St. Mihiel and ready for installation on the U. S. A. T. U. S. Grant

GENCO WINCHES have been subjected to vigorous tests from which they have triumphed over all lifting and lowering requirements . . . WITH A SUBSTANTIAL EXTRA FACTOR OF SAFETY.

GENERAL ENGINEERING & DRY DOCK CO.

100 Sansome Street, San Francisco Foot of 5th Avenue, Oakland Foot of Schiller St., Alameda

Eastern, Great Lakes and Gulf Ship Operators are invited to communicate with C. C. Galbraith and Sons, Inc., 99 Park Place, New York

---

FRANCE

TRADE MARK

"Thirty-Nine Years Satisfactory Performance"

Manufactured exclusively by

FRANCE PACKING COMPANY

Main Office and Factory
TACONY, PHILADELPHIA

Represented by
SAN FRANCISCO—HERCULES EQUIPMENT & RUBBER CO.
550 - 3rd Street—EXbrook 2575
SEATTLE—GUY M. THOMPSON
1241 Railroad Ave., South—Phone MAin 1870
PORTLAND—E. B. HUSTON
127 S. W. First Ave.—Phone ATwater 6754

For craft of every size and type in Merchant and Naval Service

PUMPING EQUIPMENT
REFRIGERATION EQUIPMENT
AIR CONDITIONING EQUIPMENT
AIR COMPRESSORS
STEAM CONDENSERS
FEEDWATER HEATERS
STEAM-JET EJECTORS
DIESEL ENGINES
STEAM TURBINES

●

WORTHINGTON offers a consulting service based on seventy-five years of successful experience in the solution of marine pumping and power problems.

WORLD-WIDE SERVICE

WORTHINGTON PUMP AND MACHINERY CORPORATION
General Offices: HARRISON, NEW JERSEY
Offices and Representatives in Principal Cities

WORTHINGTON

CDB 12

Rebuilding Our Merchant Marine

(Continued from Page 19)

enabled the ship to make her speed with approximately 33 per cent less horsepower. The improvement would have been the same had the same methods been applied to any similar cargo steamer.

It would seem to be advisable for the shipowners, the shipbuilders, and the Maritime Commission to establish some joint research body which would be entirely free from political and from naval and from commercial pressure, and would keep its sponsors reliably informed as to the progress being made in the fine arts of marine architecture, shipbuilding and marine engineering.

Let's get 10 years ahead of the field in our standardization. If we build standardized steamers why not go into the higher pressure ranges? Already we have 650 lbs. on American ships. Already they have 1,320 lbs. on German ships. Why should we standardize on 425 lbs. for foreign trade cargo carriers?

Already in European cargo carriers (even in speeds under 10 knots) they are streamlining the superstructures and the stern posts and rudders, and are lapping plates forward; in short, doing everything to reduce water and air resistance.

We must never forget that in foreign trade competition we are up against not only the keenest shipping brains of the world, but also the greatest ship design, shipbuilding, and marine engineering knowledge and experience. Therefore it follows that, in order to have "parity," we must have (over and above the subsidy, which takes care of our higher costs of operation) ships that are in every way as efficient and as capable as those operated by our competitors.

Literature of the Industry

Industrial Friction Materials, an 8-page illustrated brochure, published by Johns-Manville. A mass of data on complete lines of brake linings, brake blocks, and clutch facings for all types of industrial equipment.

The most important feature of this brochure is a chart which simplifies the selection of the most suitable friction material for any specified service. On this chart are represented brakes and clutches of the disc, cone and band types. Listed down one side of the page are all of the factors which must be considered, such as rubbing speed, drum temperature, pressure, etc. If one knows the service conditions which must be met, he can look them up on this chart and, by glancing horizontally across the page, automatically pick out the correct friction material for his purpose.

Supplementing this technical chart is a second table which gives the coefficient of friction, size limits, thickness, tolerances and recommended service conditions for each of the various types of J-M industrial brake linings and blocks and clutch facings. Also listed are the tolerances on hole locations drilled with temporary template and permanent jib.

Organic Methods Scale and Corrosion Control. This is a second edition of a 16-page booklet issued by D. W. Haering & Company and discussing underlying principles and practical applications of organic chemistry in the control of corrosion and scale. The booklet is profusely illustrated with graphs, formulae and equations of interest to the chemist and engineer responsible for scale or corrosion control in industrial operations.

The application and properties of beta glucoside and the glucoside derivatives, including the recently developed hemi phospho glucosate, is described in detail. The amounts of film inhibitor required for corrosion control are plotted against carbon dioxide, oxygen and hydrogen sulphide contents in a new graph prepared for this edition.

Periodic Process of Chlorination, an eight-page illustrated brochure issued by Specialties Engineering & Service Company, Hoboken, N.J. This booklet describes the W-B Periodic Process of Chlorination for the desliming of condensers and other heat exchange appliances. This process was developed over ten years ago by a power plant organization, and during the past eight years has been used continuously in a steam electric generating station in two condensers, each of which serves a 25,000 K.W turbo generating set. Careful records of this performance were kept and in comparison with the former mechanical cleaning method the W-B process shows better than $9000 a year saving on each unit. The steam consumption was reduced 1½ to 2 per cent. No corrosion, tube failure, leakage, or forced outage has developed during the eight years.

Goodrich Cutless Bearings, a 65-page profusely illustrated booklet bound in blue, black and gold stiff paper. This bulletin shows how water lubricated cutless rubber bearings solve operating problems in numerous types of installations on many ships, small and large. The many detailed drawings of typical installations cover outboard strut bearings and stern tube bearings from motorboats to the largest steamers. A new type of segmental construction for these bearings is described and illustrated.

Tables show detail dimensions of cutless rubber bearings and fittings for shafts up to 22 inch diameter, beginning at ¾ inch diameter and going up by eighths and quarters. The table for the sizes from 6 inch to 22 inch diameter is based on the findings of the American Marine Standards Committee and approved by American Bureau and Lloyd's.

Pacific Paint & Varnish Co.

Synthex Red Lead Primer (Q. D.)
" Anti-Corrosive
" Anti-Fouling
" White Enamel-Non-Bilge (O.S. & I.S.)
" Cabin Enamels (Q. D.)
" Mast Colors, Hull Black
" Boottopping, etc.

Synthex Marine Spar Varnishes and Yacht White Enamel
Aluminum Enamel
Flat White (Inside & Outside)
A specialized finish for each paintable surface.

Pacific Marine Finishes have been used successfully for years by most of the important steamship companies. Each represents a specially developed product for a specific purpose. Quality—not price—is the objective of our Research Department.

L. M. DuCOMMUN
President

San Francisco and Berkeley

A. B. ROBERTSON
Vice President

SWAYNE & HOYT, Ltd.
SHIPOWNERS and AGENTS
215 Market Street - San Francisco, California, U.S.A.

GULF PACIFIC LINE
(Between Gulf Ports and Pacific Coast)

CALMAR LINE
(Between North Atlantic and Pacific Coast)

YAMASHITA LINE
(Far East—New York—South America)

OFFICES:
Seattle - Portland - San Francisco - Oakland - Los Angeles - Chicago - St. Louis - Cincinnati - New York
New Orleans - Mobile - Birmingham - Houston

STOP Slipping as well as leaks on boat decks . . . through installation of

Case Weather Deck Covering

AN UNDER LAYER AND A NON-SLIP WEARING SURFACE

L.S. CASE CO.

INSTALLATIONS SINCE 1926 WITH LARGE FLEET OWNERS

L. S. CASE COMPANY

7th and Daggett Streets
Applicators and Distributors
SAN FRANCISCO
Phone: HEmlock 7821

BABCOCK & WILCOX BOILERS

Extra Values to Ship Owners and Builders

In DESIGN
Marine Boilers for Marine Service

In TRIAL RUNS
Experience Frequently Saves Money

In CONTINUOUS SERVICE
Regular Visits of B & W Service Men

The BABCOCK & WILCOX COMPANY, New York

Pacific Coast Offices:
450 Mission Street - San Francisco
Sattle
Portland
Los Angeles

For Deck Officers

(Continued from page 41)

devices for this purpose, but a steamer will have no such appliances available, and the following method of attachment, which is simple, perfectly effective, and does not damage the hawser in the least degree, is recommended. It is merely the old strop and toggle method.

Cut a piece about 2 feet 6 inches in length off a stout round wooden fender of 12 inches or more in diameter for a toggle, and then round this toggle take a complete round turn with the wire hawser at the point where the purchase block is to be attached, stopping the end back to the hauling part of the hawser and wrapping a piece of bagging round these two parts to save chafing or cutting by the chain sling later. A couple of round turns with a stout chain sling are then taken round the two parts of the hawser over the bagging, and the ends of the chain sling brought back over the toggle and shackled onto the purchase block. Unless the toggle used is too small, a hawser secured in this way will never slip, neither can it jam, and it is capable of being cast adrift in a few moments, so that a minimum of time is lost when "fleeting" the tackle.

Should the ground tackle prove ineffectual in pulling the ship off without lightening her, after a few good trials at high water, jettison of cargo should be begun. Before commencing discharge, however, the ground tackle must be hove tight and made fast to prevent the vessel from driving further aground as she is lightened, and in the event of the anchor having been already hove "home" during the previous efforts to pull the ship off, it must be again laid out and the tackle set tight before any attempt is made to lighten the vessel. There is no reason for the master to wait for instructions from anyone on this point, and he has only to bear in mind that he is there to do the best he can for all concerned, and that by taking prompt action he is in no way prejudicing either the interests of his owners or those of the underwriters. Of course, it may so happen that the vessel runs aground in some sheltered spot where the weather is not likely to affect her, and in that case a master might not be justified in sacrificing cargo as long as there was a reasonable hope of assistance reaching him without undue delay.

If the vessel is stranded with her forward half hard on the ground and the after end in deep water, or water deep enough to float her, cargo should be discharged from the after end of the ship. By this means the main body of the vessel is raised off the ground, and although it throws more weight on the extreme forward end, it is easy to drag the forefoot over the surface pressing heavily over such a large area of ground. Taking cargo out forward in such circumstances merely tips the vessel and only throws more weight and consequent friction on the widest part of the ship's bottom and largely defeats the object of discharging the cargo.

If the steamer is lying on a sandy bottom and tug assistance has been taken, the best results will be obtained by keeping the tugs towing alongside, as the tug's propellers will cut away the sand from alongside, and create a wash, thus deepening the water and helping the flotation.

When accepting outside salvage assistance a shipmaster should insist on getting the salvage agreement signed on "No Cure No Pay" terms, and leaving the remuneration to be settled by arbitration.

Trade Literature

Roofing Specifications, a handsome 36-page booklet issued by Koppers Company, Pittsburgh, and being a new edition of its standard book of roofing specifications, written in blank and ready for inclusion in architectural and engineering master specifications. Diagrams illustrate each set of specifications.

There are data concerning spray pond roofs which permit the re-use of water in air conditioning systems, and water-cooled roofs to insulate the upper floors of buildings.

Complete specifications for all types of coal tar pitch and tarred felt roofs are shown, as well as sections devoted to applications over wood decks, concrete or poured gypsum, pre-cast concrete or gypsum, book tile, steel deck or under promenade tile.

A large portion of the book is devoted to illustrated descriptions of various methods of waterproofing and dampproofing residence and deep foundations, highways, sidewalk vaults, shower baths, swimming pools, tunnels, etc.

Other sections deal with insulation, flashing specifications and metal finishing strip details.

Direct Current Motors, Bulletin 2260, Fairbanks Morse & Co., an 8-page brochure in blue, white, and black, describing and illustrating the F-M line of direct current motors.

Designed to meet a wide range of requirements, these motors are supplied in capacities up to 200 H.P. in either open or closed frame type, and in larger sizes with especially adapted frames.

Construction details and electrical characteristics are fully described.

Air and Erosion Eliminator, a 4-page bulletin issued by the Condenser Service and Engineering Company of Hoboken, N.J.

This bulletin covers some phase of the problem of deterioration and failure of condenser tubes and the successful work of this firm i eliminating the two principal cause of condenser tube failure, which ar (1) Attack by oxygen entrained the circulating water; and (2) Electrolytic action resulting in dezincication and/or electrolytic pitting.

TOUMEY ELECTRIC & ENGINEERING CO.

Representing
BENDIX MARINE PRODUCTS CO.
Successors to
CHAS. CORY CORPORATION
Signaling, Communicating and Lighting Equipment
PNEUMERCATOR CORPORATION (New York)
Gauges: Liquid Level, Ships Draft, Pressure, Boiler Water Level
PLANT MILLS DIRECTION INDICATOR AND ENGINEER'S ALARM

MARINE AND INDUSTRIAL ELECTRIC INSTALLATIONS . . . MARINE ELECTRIC FIXTURES . . . SUPPLIES AND REPAIRS . . . ARMATURE WINDING . . . . SEARCHLIGHT PROJECTORS . . . . SOUND POWERED TELEPHONES . . . . FIRE ALARM SYSTEMS

GArfield 8102 SAN FRANCISCO 115-117 Steuart Street

FERROKOTE

BITUMINOUS COATINGS - MARINE & INDUSTRIAL PAINTS

S. J. PORTER COMPANY
345 VERMONT ST. SAN FRANCISCO

L. E. CAVERLY

NAVAL ARCHITECT AND ENGINEER
MARINE SURVEYOR

●

465 California St.
SAN FRANCISCO, CAL.
Phone GArfield 7445

315 Avalon Blvd.
WILMINGTON, CAL.
Phone Wilm. 1010

SPERRY

GYRO-COMPASSES
AUTOMATIC STEERING AND STEERING CONTROL EQUIPMENT
INCANDESCENT AND HIGH INTENSITY SEARCHLIGHTS . . . RUDDER INDICATORS . . . SALINITY INDICATORS

SPERRY GYROSCOPE CO, Inc.
BROOKLYN, NEW YORK

ECO

In tube cleaners as in everything else, nothing takes the place of experience.

ELLIOTT COMPANY
LAGONDA TUBE CLEANER DEPT.
LIBERTY TUBE CLEANER DEPT.
Factory Sales and Service Maintained
813 RIALTO BLDG., SAN FRANCISCO
Phone SUtter 5213
Los Angeles, 1732 E. 7th St. Seattle, Wn., 414 Vance Bldg.

-LUCKENBACH-

EASTBOUND SERVICE SAILINGS WEEKLY WESTBOUND SERVICE
MANHATTAN - - BROOKLYN - - PHILADELPHIA - - PROVIDENCE - - BOSTON

Sailings Every 7 Days to and from
NEW ORLEANS - MOBILE - HOUSTON

Coastwise Services Between
LOS ANGELES - SAN FRANCISCO - OAKLAND - STOCKTON
and PORTLAND - SEATTLE - TACOMA

TRAVEL BY FREIGHTER

LUCKENBACH LINES
100 Bush Street, San Francisco
Head Office: 120 Wall Street, New York

PASSENGERS . . . AND . . . FREIGHT

THE LARGEST AND FASTEST FREIGHTERS IN THE INTERCOASTAL TRADE

Quips that Pass in the Night

The train, without snowplows, was notoriously slow. On one dragging winter trip the conductor was much bedeviled by passengers. The worst of the critics was a woman who insisted she had to get to Livingston in a hurry to visit a maternity hospital.

"Madam," said the conductor, "you shouldn't have gotten on the train in that condition."

To which she replied, "Indeed, I didn't."

Singer: "I insured my voice for $50,000."

Rival: "And what have you done with the money?"

"What's your name?" the store manager asked the young applicant for a job recently.

"Ford," replied the lad.

"And your first name?"

"Henry."

"Henry Ford, eh?" remarked the manager with a smile. "That's a pretty well-known name."

The boy looked pleased.

"Yes, sir, it ought to be," he replied proudly. "I've been delivering groceries around here for two years now."

"My dear," called a wife to her husband in the next room, "what are you opening that can with?"

"Why," he said, "with a can opener. What did you think I was doing it with?"

"Well," replied his wife, "I thought from your remarks that you were opening it with a prayer."

Then there was the army commander who was rotten to the corps.

A lady was entertaining her friend's small son.

"Are you sure you can cut your meat?" she asked after watching his struggles.

"Oh, yes," he replied, without looking up from his plate. "We often have it as tough as this at home."

The little child was sitting demurely on the couch, watching her mother smoking a cigarette. Her little nose was wrinkled and in her pale blue eyes there was an expression of childish disillusionment. Finally, unable to stand it any longer, she burst out in her quavering falsetto: "Mother, when the hell are you going to learn to inhale?"

"Was she pleased when you gave her that charming undie for her birthday?"

"Yes, but she cried a little."

"She did?"

"Yes, she said it was her first slip."

A violinist entered a little music shop in London.

"I want an E-string, if you please," he observed to the man behind the counter.

Nervously producing a box from behind the counter, the cockney said:

"Would you mind pickin' one out for yourself? Y'know, I 'ardly can tell the 'e's from the she's."

Impatient Customer (in the five-and-ten): Who attends to the nuts?

Girl: I'll take care of you in just a minute, sir.

Newspaper Item: Mrs. Lottie Prim was granted a divorce when she testified that since she and her husband were married he had spoken to her but three times. She was awarded the custody of their three children.

May: "My fiancee is telling everybody in India that he is coming home to marry the most beautiful girl in the world."

Edna: "Too bad, darling, after being engaged to you for such a long time."

Tramp: "Lady, have you got an organ I can tune for you?"

"How ridiculous! We have no organ in this house."

"Then if I can't earn anything, how about giving me a bite to eat?"

Guest: "Do you run a bus between the hotel and the railway station?"

Manager: "No, sir."

Guest: "That's strange. All my friends said you would get me coming and going."

Mother: "Marilyn, were you a good little girl at church today?"

Marilyn: "Yes, mother. A man offered me a big plate of money, and I said, 'No, thank you.'"

"A good worker derives a great deal of pleasure when he steps back to view the effects of his work," asserts a builder. Unless, of course, he's a steeplejack.

"Did he take his misfortunes like a man?"

"Precisely. He laid the blame on his wife."

Adam and Eve were naming the animals of the earth when along comes a rhinoceros.

Adam: "What shall be call this one?"

Eve: "Let's call it a rhinoceros."

Adam: "But why a rhinoceros?"

Eve: "Well, because it looks more like a rhinoceros than anything we've named yet."

"There I was, forced down on a desert island with a lovely blonde."

"What did you do for food?"

"Darned if I can remember."

ACIFIC
ARINE
EVIEW

PRIL
938

H. D. Collier

You can't imitate the beauty of REAL SILVER FOX

There is something about the beauty, sheen and lustre of a fine fur that almost immediately reveals its quality . . . just as the appearance or construction of many Marine supplies reveals instantly how well made and dependable they are.

But rope is one Marine product from which its dependability and strength cannot be determined by a casual examination. It takes actual usage in duty to prove how a rope will stand up when it is put to the test.

Experienced buyers of Marine rope on the Pacific know this. They know that they must place their confidence in the skill and experience of the manufacturer of the rope.

It is only natural then that, on the Pacific, Tubbs Marine rope (SUPERCORE and EXTRA SUPERIOR MANILA) have long enjoyed a position of leadership. Behind them stand 82 years of rope making experience. . . 82 years of PROVEN PERFORMANCE under the most exacting conditions of the sea.

TUBBS ROPE

TUBBS *Cordage Company*
200 BUSH STREET, SAN FRANCISCO

PACIFIC MARINE REVIEW

APRIL 1938
VOL. XXXV NO. 4

CONTENTS

Editorial Comment:

The Pacific-American Merchant Marine 17

"Let's Start Rebuilding Our Merchant Marine in 1938" 18
I. (Continued) American Shipbuilders Answer U. S. Maritime Commission.

H. D. Collier 20
Second of the New Standard Oil Company of California Tankers.

Hongkong to San Francisco 29
A Clipper Race of the 1850's.
By Capt. Christen Julius Klitgaard.

Your Problems Answered 32
By "The Chief".

For American Deck Officers 35

Geared Diesel Drive for Marine Propulsion 37

Why Capital Lacks Confidence in Shipping 38
By S. A. Oyen.

Maintenance Jobs for Ship and Shore 40

On the Ways:

Latest News from American Shipyards 42
Building in American Yards 44

Progress of Isherwood Hull Construction System 47

Propeller Club News 50

Miscellaneous:

Book Reviews, 34; Engineers' Licenses, 34; Monthly Review of Tanker Markets, by Oscar J. Beyfuss, 36; Change of Masters, 36; Deck Officers' Licenses, 36; Rezo Doors for Safety on Board Ship, 62; Automatic Combustion Control on H. D. Collier, 62; Bridgeport Brass Expanding, 64.

Our Frontispiece

Our frontispiece in this issue is re-
oduced from a photograph of a
inting by the noted American mar-
e artist, Charles R. Patterson of New
ork. The painting depicts the Amer-
n bark Rachel leaving the harbor
Portland, Maine, in 1873.

BLISHED AT 500 SANSOME STREET . . . . SAN FRANCISCO

ed as second class matter June 20, 1913, at the post office, San Francisco, under the Act of March 3, 1879. Published on the 1st of each
h Advertising and editorial forms close on the 15th. Subscription price, one year: Domestic, $1.50; foreign, $2.50; two years: Domestic,
. foreign, $4.00; three years: Domestic, $3.00; foreign, $5.50; single copies, 25c. Chas. F. A. Mann, Northwest Representative, 1110
Sound Bank Bldg., Tacoma, Washington. New York Office, Suite 404-405-406, Two Hundred Broadway, Telephone COrdlandt 7-3579

ew York City copies of Pacific Marine Review can be purchased at the news stands of I. Goldberg, 42 Broadway; Jacob Fuchs, 17 Battery
Philip Mandara, Greenwich Street and Battery Place. In Washington, D.C., at the news stand of the Carlton Hotel, 16th and K Streets.

J. S. Hines
ent and Publisher

B. N. DeRochie
Assistant Publisher

Alexander J. Dickie
Editor

Paul Faulkner
Advertising Manager

F. Dryden Moore
Assistant Editor

PACIFIC MARINE REVIEW

VOLUME XXXV APRIL 1938 NUMBER 4

The Pacific American Merchant Marine

No one who has watched the progressive lay-up of American flag ships on the Pacific Coast during the past year can fail to be alarmed over the future of the Pacific-American Merchant Marine. Our coastwise passenger service has virtually disappeared—our transpacific services have been reduced to one line—our intercoastal passenger services are vanishing very rapidly.

When a ship or shipping gets into troubled seas, it is always well to take soundings and to try to get independent bearings so as to have all possible information available in charting a safe course out of difficulties. We are therefore quoting our editorial message this month from a contemporary who covers a somewhat different field but who, nevertheless, is vitally interested in shipping and particularly in Pacific Ocean shipping.

The following is taken from "The Timberman, an International Lumber Journal," published in Portland, Oregon. This editorial reflects a very sane and comprehensive viewpoint concerning American Shipping, American Foreign Trade, and American Unemployment.

Representatives of lumber and other Pacific Coast export firms added their united plea for an enlarged and subsidized merchant marine at the recent Maritime Commission Board hearings held in San Diego, Los Angeles and San Francisco, California; Portland, Oregon; Tacoma and Seattle, Washington. There was unanimity of accord indicating the direct influence which an American merchant marine exerts in promoting and expanding foreign commerce.

Instances were cited where it was alleged foreign line owners interested in specific industries gave preferential rates and services to those industries in which ownership relationship existed. Just how far this situation exists in any particular trade is of course difficult to measure, but where such a combination does exist it constitutes an unfair competitive situation. But the paramount question is how to enable the American merchant marine to compete with foreign lines enjoying a lower investment in ships built in European or Oriental yards, coupled with lower operating and wage standards. Manifestly, without an enjoyment of equal competitive costs, the race is lost before it is started.

The United States is now the largest manufacturing nation in the world and should be in a position to transport a large percentage of her products to distant markets in her own ships. Besides the angle of encouraging foreign trade through the maintenance of an American merchant marine, it is felt from the standpoint of national safety, and as a necessary auxiliary to our navy, that a sufficient number of American merchant vessels must be made available in case of war, more especially since this country is going forward with an expansion of its navy to equal the largest sea force now existent.

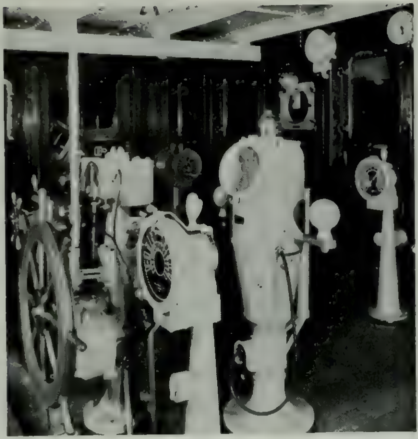
It is not likely, however, that Congress would admit foreign built vessels to American registry and to enjoy subsidies except under extraordinary war time necessity. This avenue in the equalization of costs is therefore closed to the American shipowner. In the successful maintenance of an American merchant marine the vital question of return cargoes must be considered. Ships cannot operate profitably with outward cargoes and return in ballast, except at a prohibitive cost which stretches far beyond the aim of any contemplated subsidy system.

(Page 56, Please)

"Let's Start Rebuilding Our Merchant Marine in 1938"

“Let's Star

Ou



I. *(Continued) American Shipbuilders Answer U. S. Maritime Commission*

H. Gerrish Smith, president of the National Council of American Shipbuilders, when asked if he had any comment to make on Mr. Kennedy's report to the President on the cost of shipbuilding in the United States, stated that those members of the National Council of American Shipbuilders who submitted bids on the Maritime Commission's C-2 design of cargo vessel are ready at any time to sit down with the Commission and to analyze with them the reasons for the alleged high bids on these vessels. Mr. Smith further stated that he hoped final judgment on this matter would be reserved until the correct facts are known.

The high cost of shipbuilding at the present time is not confined to the United States, as repeated statements in the British press indicate a rise of shipbuilding costs in that country during the past eighteen months of fifty per cent. Costs of shipbuilding in any country are largely beyond the control of the shipbuilder as only approximately forty per cent of the cost of building a vessel is for work performed within a shipyard.

Broadly, those factors affecting costs are:

(a) Requirements of the design and specifications;

(b) Prevailing labor rates;

(c) Prevailing material costs.

● Hog Island Comparison Unfair

The comparison made by Mr. Kennedy of the bids on the C-2 design with the Class A vessels built at Hog Island during the World War is unfortunate. These two types of vessels can be no more compared than it would be possible to compare a Rolls Royce automobile with a Ford car. Both of the former, of course, are ships, and both of the latter are automobiles, but that is about where the comparison ends. The C-2 design is a much larger ship than the Class A ships. Its cubic number is about seventy-five per cent greater than the Class A design. The horsepower of the C-2 design is 6,000 for a maintained sea speed of 15½ knots as compared with a 10½ knot ship—the speed actually made by the Class A boats—with 2,500 horsepower. This fact alone is responsible for a much higher cost of the C-2 design, estimated to be at least $400,000. Added horsepower means more weight and more ship per unit ton of deadweight.

The Class A design had steam deck machinery while the C-2 design has electrical auxiliary machinery throughout, which adds greatly to the cost of construction. The C-2 design covers all the latest requirements for safety of life at sea, in sofar as applicable to cargo vessels, also all of the details that the art and science of shipbuilding has developed during the past twenty ye If the Hog Island Class A vessels been built to the specification quirements of the Maritime Com sion's C-2 design, their cost w have been enormously increased

● Shipbuilding Labor Costs

In addition to more exacting sp fication requirements shipbuild labor rates have advanced until t are at least ten per cent higher th the war-time labor rates that p vailed during the construction of Type A Hog Island vessels. Dur the past five years shipbuilding bor rates as reported by the Bur of Labor Statistics, Department Labor, have advanced from cents per hour on June 1, 1933, 83.8 cents per hour for Novem 1937; that is, over fifty per cent.

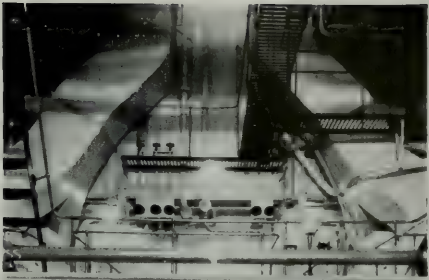
● Material Prices

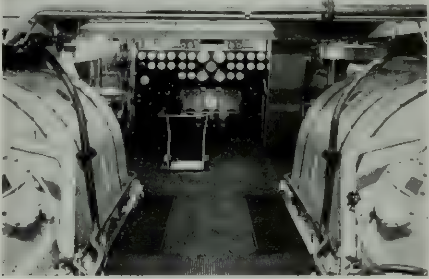
Prices for materials and eq ment are also affected by prevail labor rates, so that much hig quotations on material and eq ment apply today than in 1 Wholesale prices for a few imp ant shipbuilding materials as ported by the Bureau of Labor S tistics, Department of Labor, lat 1937, as compared with prices ea in 1933, show the following creases:

Iron and steel products	32.
Structural steel	32.
Non-ferrous metals	100.
Lumber	77.
Furniture	21.
Paint and Paint Materials	21.
Textile products	47.
Metal and Metal Products	26.

Another factor causing hig costs since 1936 has been the So Security Tax, which is adding the cost of shipbuilding labor 1938 about 4 per cent. A still furt factor is one week's leave with which is becoming quite general the shipbuilding industry, with

Rebuilding Merchant Marine in 1938"





other 2 per cent addition to the cost of labor.

● Commission Protected

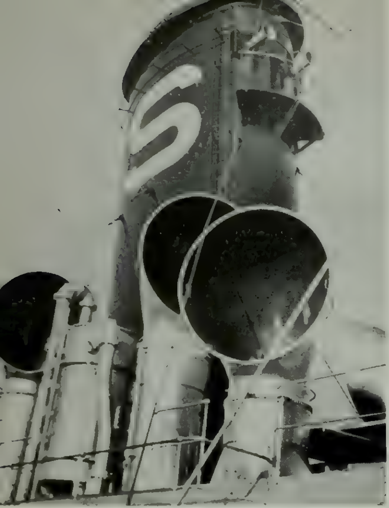
Notwithstanding the fact that costs are largely beyond the control of either the shipbuilder or the suppliers of material the Maritime Commission is protected on costs, as the shipbuilder is limited by the Merchant Marine Act of 1936 to a maximum profit of ten per cent of the contract price, with no guarantee against loss and with the certainty that after probable cost disallowances and payment of taxes that his possible profit is considerably less than ten per cent.

In expressing his individual opinion as to the building abroad of vessels to be subsidized by the Maritime Commission, Mr. Smith stated that in his opinion such a plan is unthinkable as the high cost of ships in the United States as compared with the cost of ships abroad is due to the high standards of living in the United States and wage scales that have been created as a national policy to increase the purchasing power of the individual and maintain that standard. These higher wage scales are responsible for the greater home comforts and luxuries enjoyed by the American employee but not enjoyed by other countries. The American workman goes to his place of work in an automobile. The foreign worker goes on a bicycle or on foot.

● American Ships— American Built

To build up our merchant marine with foreign built vessels would impose a penalty upon American labor through a reduction in employment solely because of the high wage scales existing in the United States. If the United States is to have a merchant marine it should be built as mandated in the Merchant Marine Act of 1936, that is—American Built.

There is now only one American flag transpacific liner in the same class as the three Nippon Yusen Kaisha motor passenger liners.



H. D. Collier

Second of the Tankers for the

Spic and span, the new tanker H. D. Collier of San Francisco steamed into the quiet waters of her home port on March 23. This vessel, second of the pair of modern tankers built by the Sun Shipbuilding and Dry Dock Company of Chester, Pennsylvania, for the Standard Oil Company of California, is an exact duplicate of her sister vessel, the W. H. Berg, which was described in considerable detail in the February issue of Pacific Marine Review. We will therefore omit here much of the general description and allow our illustrations to tell most of the story.

The general characteristics of this ship are:

Length overall	459 feet 6 inches
Length B.P.	442 feet 0 inches
Beam molded	65 feet 0 inches
Depth molded (U.D.)	35 feet 0 inches
Sheer forward (F.P.)	10 feet 0 inches
Sheer aft (A.P.)	5 feet 0 inches
Camber U.D.	16 inches
Summer draft	28 feet 7-13/16 ins.
Displacement	17,320 tons
Deadweight capacity	12,800 tons
Gross measurement	8,298.4 tons
Net measurement	4,934 tons
Cargo capacity 98%	103,417 barrels
Fuel capacity 98%	10,471 barrels
Fresh water capacity	271 tons
Engine power	3,500 H.P.
Propeller speed	85 r.p.m.
Ship speed loaded	13.64 knots
Cruising radius	20,000 miles
Cargo pump capacity	12,000 barrels per hour

The cargo capacity is divided into a total of 24 tank spaces by eight thwartship and two longitudinal bulkheads. All the main or center cargo tanks except No. 5 measure 34 feet in the length of the ship and 36 feet in the beam. In number five tank the space occupied by the pump room is taken out of these dimensions. All of the 16 wing tanks measure 34 feet in length by 14 feet 6 inches in beam.

Structural details in this hull are built on the Isherwood Bracketless, especially modified in design for the use of welding on all framing joints and for riveting of deck and shell plating. This method of construction saves considerable weight in frame members, and this weight is put into heavier sections in those portions of the hull most subject to corrosion and pitting, thereby reducing maintenance costs and adding to the useful life of the hull.

The piping system on this ship is arranged to give complete control for pumping four different petroleum distillates without danger of contamination. Four pumps of the Northern rotary type, each driven by a Whitton steam turbine, are installed in the pump room amidships. These pumps have a combined capacity of 12,000 barrels an hour, and can easily discharge a full cargo in nine hours.

All cargo tanks are protected from fire or explosion danger by several devices manufactured by Shand and Jurs of Berkeley, California, including Vacuum Vent valves, Visible Tape gages, flame arresters, and gas freeing ejectors. These spaces are also fitted for the Standard Oil system of filling the ullage spaces wit washed and cooled boiler flue gase to prevent fire.

Fittings are installed also for th Butterworth cleaning system fo cargo tanks. This system uses whirling spray of hot salt water. I is served by a special Davis Engineering Company Paracoil heater an by the Worthington fire pump.

● Accommodations

Of the accommodations for officers and crew, nothing need be sai except that they are identical t those on the W. H. Berg, as describe in February Pacific Marine Review and are therefore the finest afloat The pictures tell the story far bette than words.

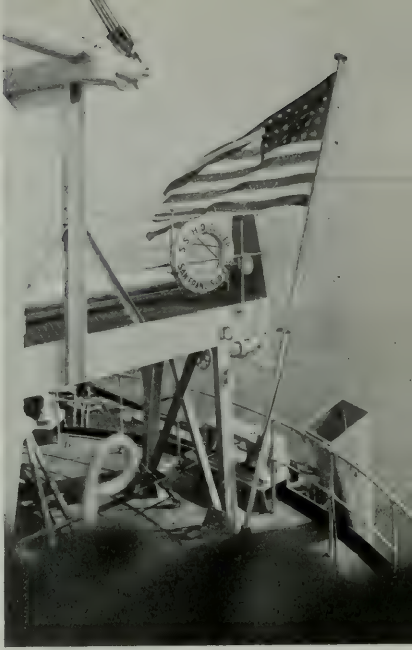
The standards of space, sanitatio and installed comforts and conveniences in these accommodations ar far better than those provided fo first-class passengers on the grea majority of passenger steamers today.

One item of equipment overlooke in the February description is tha all quarters are heated by steam radiators of the Shaw Convector typ supplied by the Shaw-Perkins Manufacturing Company.

● Deck Machinery.

A large item in the expense o handling tankers at their docks an moorings is manila hawsers. O these new ships Standard Oil Company of California Marine Department is trying out wire rope. T handle this they are using moorin

New American Built
Standard Oil Co. of California



engines instead of the usual warping winches. Like her sister the W. H. Berg the H. D. Collier has five steam mooring engines supplied by the American Engineering Company. These engines can be set to put a predetermined strain on the wire cable. While the wire rope is not in use it is kept coiled on the mooring engine drum. The American Engineering Company also supplied one warping winch, two cargo winches, the windlass and the steering gear. The windlass is a steam engine drive of the usual type with ample capacity to take care of all stress and strain imposed by the ship at anchor. Naco cast steel stud link anchor chain, supplied by the National Malleable and Steel Castings Company, is used on both the H. D. Collier and the W. H. Berg.

Located on the half deck aft of the engine room, the steering gear is of the American Engineering Company well known electro-hydraulic type. Its rams are actuated by Hele-Shaw hydraulic pumps driven by General Electric motors under control of an electric telemotor actuated either manually or by the Sperry Gyro-Helmsman in the pilot house.

● Steam Generating Plant.

H. D. Collier is a single screw vessel. Her propulsion machinery consists of a Westinghouse cross compound double reduction geared 3500 horsepower turbine, taking steam at 425 pounds pressure and 725°F. from two Babcock and Wilcox sectional-header single-pass type water tube boilers. Three Babcock and Wilcox boilers are installed—the third being used for providing saturated steam for use in port to clean tanks, heat cargo, drive cargo pumps.

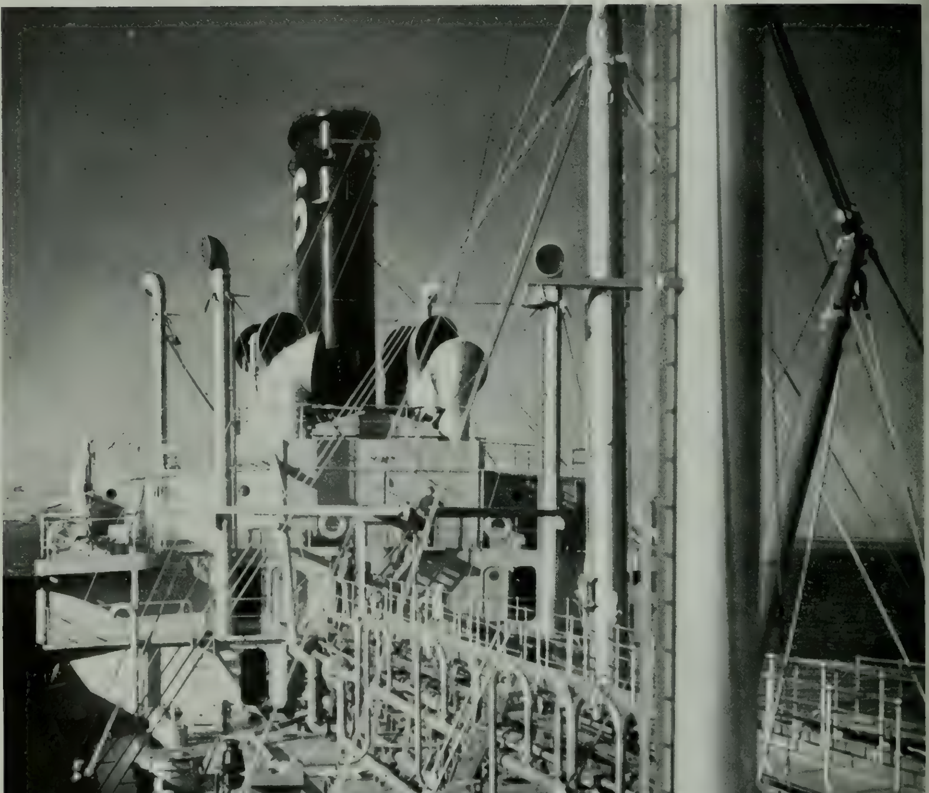
All of these boilers are mounted on a flat or half deck above and aft of the main propulsion turbine. All of them are equipped with air heaters. The two boilers which furnish steam for propulsion are equipped with superheaters of the interdeck type having tubes arranged transverse to the

H. D. COLLIER

Vice President Standara Oil Company of California

H. D. Collier became vice president of this company on January 1, 1931, after 28 years of service during which he advanced from salesman through the various grades of the sales organization and its administrative management.

Sailors off watch on board tanker H. D. Collier.
Above, a stateroom for two seamen.
Below, seamen's recreation room.
No hotel rooms are more completely equipped

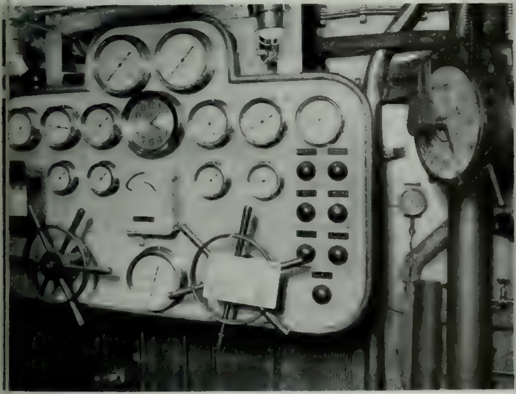


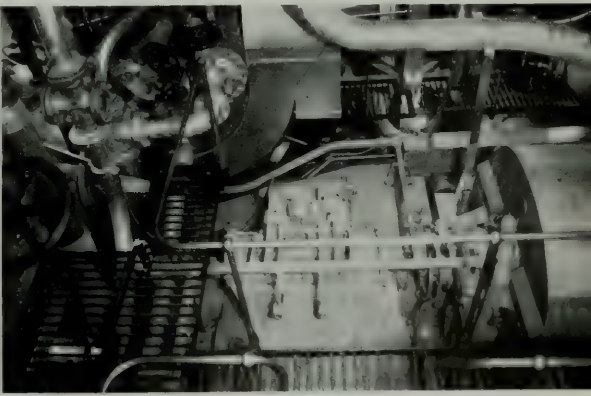
(Illustration from an infra-red photo furnished by Standard Oil Co.)

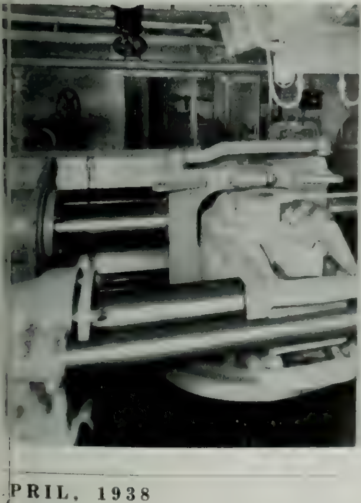
The deck of a modern tanker is a maze of pipes and gadgets each definitely designed and installed to perform some very definite function in the safe and efficient loading, transport and discharge of petroleum and its distillates.

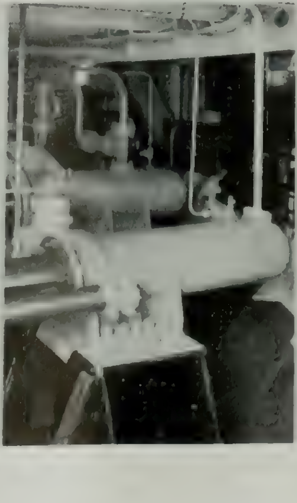
An unusual weather combination for a California tanker. The deck covered with snow and a blizzard raging, but inside the pilot house all is snug and the Sperry Gyro Pilot and Gyro Compass repeaters are ready for business.

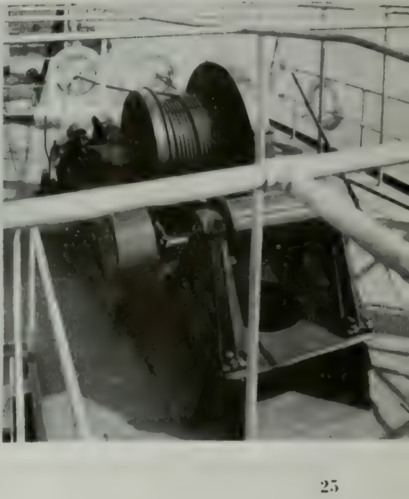
Center left: Control stand in engine room. Center right: Looking down from upper grating on low pressure casing of Westinghouse 3500 S. P. cross compound double reduction gear turbine. Lower left: American Engineering Company steering gear. Lower right: American Engineering Company mooring engine.











Captain S. C. Sullivan, master of
H. D. Collier

boiler tubes and headers located between the inner and outer casings of the boiler, where they are easily accessible. These two latter boilers are also equipped with desuperheaters of the internal drum type so that they can furnish low temperature steam for auxiliary purposes when required.

Each main boiler has 3596 square feet of heating surface and a generating capacity of 17,000 pounds superheated steam per hour. The auxiliary boiler has a heating surface of 4480 square feet and a generating capacity of 33,700 pounds of saturated steam per hour.

All furnaces are protected by water cooled side walls consisting of a vertical row of tubes of the B. & W. Stud-Tube construction, expanded into headers at the front and rear of each wall. These tubes have studs welded to the face of the tube on the side next the furnace, and these studs hold securely a covering of chrome plastic refractory which resists the high temperatures and the slagging action incident to oil firing.

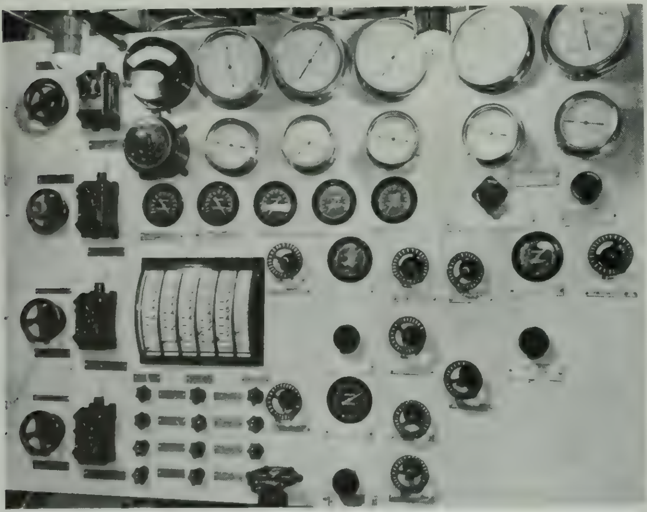
The double casing installed on these boilers forms a passage for the combustion air from the heaters to the burners. This arrangement reduces heat loss to a minimum and maintains a cool fire room. An ample installation of Diamond Soot Blowers maintains clean heating surfaces on boiler and superheater tubes.

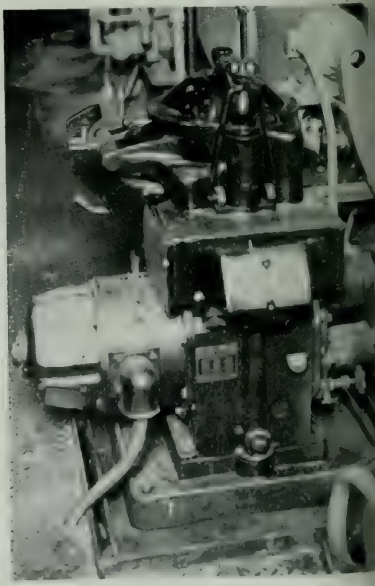
Burners are the famous "Hexpress" mechanical atomization type supplied by the Todd Combustion Equipment Company. These burners are served with fuel oil under pressure by two Northern rotary pumps each driven by a General Electric motor. On its way to the burners this oil passes through an oil heater supplied by the Davis Engineering Company. These burners and the complete fuel combustion system are automatically controlled by the Hagan system, which keeps the fuel oil and the combustion air properly proportioned for complete combustion at all times.

Three feed pumps—all Worthington—supply these boilers with water. Two of these pumps are steam turbine drive centrifugals, the third is a steam driven reciprocating pump for a standby. The first stage feed water heater is a Worthington of the deaerating type, and the second stage heater was supplied by Davis Engineering Company. Double bottom tanks under the engine room provide for an ample supply of make up feed water, and further insurance of feed water is provided by the installation of a large capacity salt water evaporator and distiller, and of a fresh water distilling set, all supplied by the Davis Engineering Company.

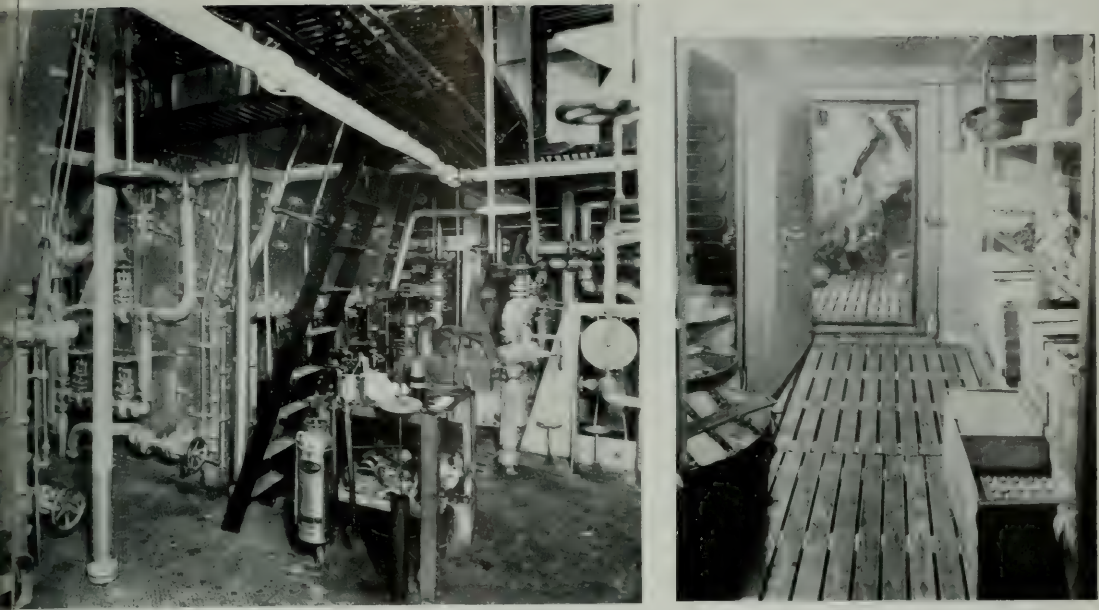
● Propulsion Machinery.

The Westinghouse cross compound turbine is connected to the propeller shaft by Westinghouse double reduc-





Above: The front of the Hagan Combustion Control Board. At right: The De Laval latest type Uni-Matic lubricating oil purifier.



Left: View in fire room, showing one of the 3 Babcock and Wilcox water tube boilers. Right: Interior of cold storage rooms.

id gearing of the new single case type. At normal full speed and power the high pressure rotor of this turbine runs at 5097 r.p.m. and the low pressure rotor at 3592 r.p.m. These speeds are reduced to 85 r.p.m. on the propeller shaft. The normal output at these speeds is 3500 shaft horsepower which, on trials, gave a ship speed fully loaded of better than 1[illegible]4 knots.

The low pressure casing of this unit is mounted on top of and exhausts directly into a Westinghouse two pass condenser with 4700 square feet of cooling surface served by a Westinghouse air ejector with inter and after condenser. Circulating water is provided by a Worthington 1[illegible] inch vertical centrifugal pump driven by a General Electric motor and having a capacity of 6000 gallons per minute. This combination will maintain a vacuum of $28\frac{1}{2}$ inches under the normal conditions obtaining on this ship.

Thrust of the turbine rotors is taken on Kingsbury thrust bearings built into the casing. The bearing on the high pressure rotor has an 8-inch collar with six shoes on the loaded side and three shoes on the unloaded side. On the low pressure rotor the thrust bearing has a 9 inch collar with six shoes on each side. For the thrust of the main propeller shaft a Kingsbury thrust bearing of the six shoe type with 25 inch diameter thrust collar is built into the forward end of the reduction gear housing.

These two turbine thrust bearings are designed on a principle which ensures flooded lubrication with rapid circulation and a minimum of churning action on the oil.

Clean oil is insured in the bearings of the propulsion machinery by the installation of the latest type De Laval Uni-Matic centrifugal oil purifier. Two Northern rotary motor driven pumps circulate the lubricating oil. Two Davis Engineering Company coolers keep the lubricating oil at the right temperature.

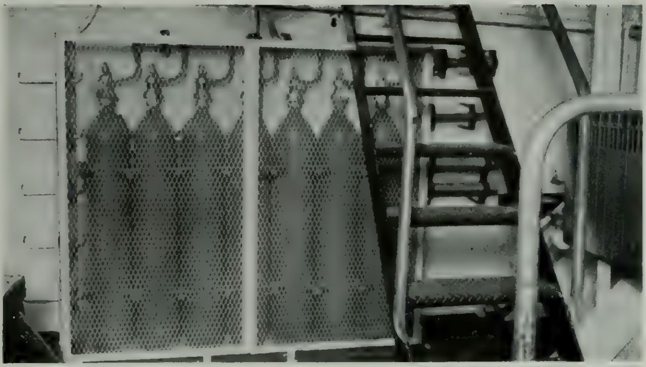
This vessel, like her sister the W. H. Berg, has a 28-cylinder C-O-Two carbon dioxide type fire extinguishing system for the protection of engine and boiler rooms.

The twenty-eight C-O-Two cylinders located in the steering flat may be discharged from either of two control stations by means of direction valves. The station for engine room protection is located in the upper deck port passage; the one for boiler room protection is on the operating platform.

R. C. Warner, Chief Engineer of H. D. Collier.

● Auxiliary Power Plant.

The generator flat is on the port side of the engine room and is located 29 feet 6 inches above the keel, so that it is a little above the load water line. Here are installed two



Seven of the 28 C-O-Two cylinders that protect the engine and fire rooms.

General Electric 125 K.W. gear drive turbo-generator sets for supplying power to the numerous motors driving auxiliary machinery and to the electric light circuits. For emergency and pier use there is one General Electric 50 K.W. gear drive turbo-generator set which will operate on saturated steam at 200 pounds. There are also two General Electric motor generator sets for supplying current for special purposes. The General Electric Company supplied: The switchboard for power and lighting circuit control; practically all the motors for auxiliary machinery; and practically all motor starting and control devices.

Turbines driving the generating sets exhaust into a Worthington condenser of 1650 square feet heat exchange surface. This condenser is served by: A Worthington air ejector; a Worthington 8 inch horizontal centrifugal circulating pump; and a Worthington 2 inch Monobloc centrifugal condensate pump. All of these pumps are driven by General Electric motors.

On the starboard side of the engine room at the same level as the generator flat is installed a very well equipped machine shop. Tools include: A Rahn Larmon engine lathe; a Sibley drill press; a Steptoe shaper; a Hisey Wolf floor type grinder; a substantial work bench; an ample supply of machinist's small tools; a Worthington motor driven air-compressor; a Westinghouse Air Brake steam driven air-compressor; and a compressed air tank.

● **Navigating Equipment.**

Perhaps the most useful piece of navigation equipment on this ship is the radio direction finder of the new Kolster type made and installed by the Mackay Radio and Telegraph Company. This precision instrument is mounted directly over a repeater from the Sperry Master Gyro Compass and readily indicates the bearing of the source of any radio signal. Since the U. S. Lighthouse Service has established radiobeacons at lighthouses so as to form an unbroken chain along our coasts, it is possible to spot ship positions accurately by radio direction finder regardless of weather or time.

Mackay Radio and Telegraph Company also supplied the radio communication equipment, which is of the most modern type. This installation includes: A 500 watt combination intermediate and high frequency transmitter; an all wave Type 117-A receiver and a crystal receiver; a Type 101-A radio auto alarm; and a Type 142-A 50 watt emergency transmitter with power supply from an Exide Type M.V.A.-13 twelve volt storage battery.

On the deck at the starboard side of the bridge house is installed an electric sounding machine supplied by the A. Lietz Company of San Francisco.

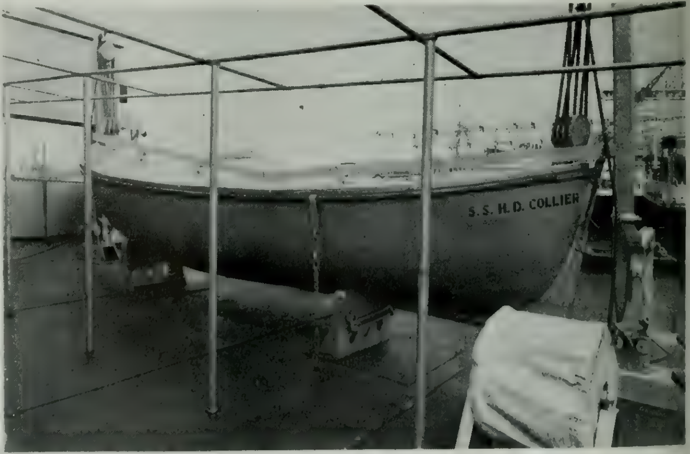
In the chart room is located the Sperry Master Gyro Compass of the new type with thermionic (non-contact) type follow up system. This master unit controls three bearing repeaters, one steering repeater, and one radio-direction-finder repeater.

In the wheelhouse there are many necessary and useful gadgets for insuring good navigation. Here is the Fathometer, supplied by the Submarine Signal Company. This instrument will give almost constant indication of changes in depth of water under the ship's keel.

A very neat switchboard supplied by Russel and Stoll controls the running lights.

Here, too, are the Sperry Course Recorder, Sperry Rudder Indicator, Sperry Incandescent Searchlight, and Sperry Gyro Pilot. This last is of the two unit type, the control unit being alongside the handwheel in the wheelhouse, and the power unit at the steering engine. When a ship is set on a certain course and the helm turned over to the Gyro Pilot, she is

(Page 43, please)



One of the four Welin lifeboats hung on Welin gravity davits which insure emergency safety for officers and crew of H. D. Collier.

Hongkong to San Francisco

Clipper Race of the 1850s and Some Experience in River and Coastwise Schooners

By Captain Christen Julius Klitgaard

(After some sea experience on the lantic and on the European Coasts a seaman and as mate, our author ts a first mate's ticket and a job a first mate on the ship Benjamin Howard, bound for Hongkong. At is latter port no business offers, d as he has a great desire to see lifornia he obtains his honorable scharge from that ship and seeks a berth on a ship bound for San ancisco.)

I was in Hongkong several weeks fore I secured a job; my inclinan being for California and only w ships went that way.

Of course, the continued loafing ound Hongkong soon became most esome and money began to get arce. Every day a friend of mine, English mate named Williams, d I used to take a trip around the rbor looking for a berth and so day we heard that there was American ship "Mastiff"[1] bound San Francisco that needed a ole new crew. We were not told at the reason for this state of af- rs was due to the former crew ving deserted on account of being streated and that the Captain had ually hung two of the crew a few ys before arriving in Hongkong.

The sailors on these ships were, re often than not, the very scum the earth, the lowest class of soled sailors there was to be had. ey were, nine times out of ten, patrons of the very lowest of rding houses; men that were ught and sold by the boarding use runners like cattle; drunkards, eves, pirates and often murderers. ople that owned neither money, clothes, nor morals. Many of men shipped on American ships had never seen the sea before, at least not from the deck of a ship; many shipped to evade the police and therefore the crew in the focsle were, as a rule, an awful collection of the world's human dregs. More particularly is this the case when a crew is shipped in New York, San Francisco, Calao, Hongkong, Antwerp, Havre and Liverpool. I have shipped men in all these ports and therefore speak from experience.

When coupled to this, one bears in mind the ever present desire of the American master to make speed, is it any wonder the men complain of being treated harshly? And, when in addition to a desire for speed, the officers are really brutal, which might naturally result from the strain of trying to work such a low type of men, it is not difficult to understand that there was constant trouble with such crews.

This story is taken from the book "Fifty Years as Master Mariner," a personal narrative written by Captain Christen Julius Klitgaard and published through the courtesy of his son Carl E. Klitgaard, Chief of Construction and Repair Division, Marine Department, Standard Oil Company of New Jersey.

One fine morning when we had barely sufficient money to pay our room rent, I finally won Williams over to my side and he went down with me to the American Consul's office to sign on the "Mastiff" articles. The skipper was there and before we signed on he was friendly (?) enough to say, "Listen men, before you sign on for my ship, I want to tell you that if you do not know your work, you had better not sign on the articles. If you are real sailors you will be treated well, but if not, you would be better off in Hell. Now don't come and tell me you haven't had fair warning and I want to tell you further that I hung two men last trip and if you are no better than they were you'll get the same treatment."

In reply to this tirade we told the skipper that we knew our jobs and were not a bit afraid to sign on with him. We were the only two that signed on that day, the rest of the waiting crowd went away, notwithstanding, as I said before, there were about 700 men looking for work. It wasn't till three weeks after we had signed on that a full crew was secured.

The crew consisted of twenty-five able (?) seamen, five men before the mast, sailmaker, carpenter, steward, cook, three mates, the Captain, and two Chinese waiters—forty men in all. The "Mastiff" was one of the largest American ships afloat, being a three skysail yarder of 2500 tons burden.

---

[1] This American clipper was built by Donald McKay at East Boston, Mass., in 1856. She measured 1034 tons, was owned by Warren Delano of New York. When five days out of San Francisco bound for Hongkong (evidently on the return passage of the voyage described above) on September 10, 1859, she was burned at sea and became a total loss.

Williams and I went on board the day after we signed on and were all alone in the focsle of that big ship for many days; the third mate, a tall strongly built fellow, met us as we came over the rail and when he saw our sextant cases he wanted to know what they were. When we told him, he ordered us to throw them overboard, telling us we would not be asked to navigate the ship from the focsle. He promised us plenty of opportunity to see the horizon from the skysail yards and if we wanted to see stars, why we had something that would help us to do so, and showed to us his immense fists. We didn't say anything in reply to this reception, but asked him again for permission to keep our instruments and to this he finally agreed, after having examined the cases and our duffle bags, to assure himself we were not carrying any weapons with us. He had previously thrown two sheath-knives overboard without formality, as we were only allowed to carry pocket knives.

We were put to work at once and I reported to the second mate who was himself turning deadeyes in the main shrouds. I went to work with a will and he quickly discovered I knew my job, which resulted in his treating me fine the whole trip.

The second mate was a six footer, strong as an ox and as mad as a hatter; he was a German. The mate was of medium height, friendly and good-humored, a real American. The skipper was a good man, very fair and just but exceedingly strict and very quick tempered; he was born on Sylt and was, therefore, a Schleswiger.

At last the day came when the entire crew was onboard and that same day we took onboard 600 Chinamen who were quartered in the 'tween decks. There was a lot of noise and excitement before we got them properly stowed away, what with shouting and yelling both in English and Chinese, not alone on our ship but also in the dozens of sampans that came alongside; and it kept on until late into the night.

The first thing next morning, we started to get the ship ready for sea. A few cabin passengers came onboard and at eleven o'clock the Captain stepped over the side. He asked the mate, who met him at the companion ladder, if all was ready and on being informed it was, gave orders to sail; then we heard the mates mellow low voice shouting, "Man the windlass boys and aweigh anchor", and almost before the bosun had time to repeat the order, the anchor was on its way up, to the tune of a smart Yankee chantey. Soon the order came to avast heaving and make sail; like a lot of monkeys ,we swarmed up the rigging and within a few minutes one white sail after the other was flung to the breeze, and in short time they were set, and the beautiful ship swung on her way under a huge white cloud of canvas.

A short distance away lay the proud American ship "Aurora,"[2] also ready to sail and bound for Frisco and there was a bet of $5000. to be won by the first ship to anchor in San Francisco Bay. The "Aurora" had hove short and set her sail in company with us and to the shouted orders of mates and the song of the crews, the two ships swung away simultaneously, and in the light breeze skimmed proudly through the water.

There is surely no sight more beautiful, at least to a sailor, than the sight of a full-rigged ship setting her immense spread of canvas and sailing away into the sea, and more especially when it happens, as in this case, that the vessel sails out of the beautiful harbor at Hongkong.

These two ships that sailed were, at that time, two of the finest models among America's famous fleet of sailing vessels. The rigging reached high into the heavens, the yards were broad, the sails of finest white cotton duck and fitted to the yards so that they looked like a huge white sheet stretched between deck and skysail top.

When we cleared the harbor a little more wind came up and we stood out through the Lemeen Passage accompanied by the "Aurora," and before sundown we were well out to sea, with everything spick and span from truck to keel.

We were divided into two watches, each watch having its own focsl the door to which was locked by th mate as soon as the watch was o deck and was not opened again ti the watch was over. Williams an I were on the second mate's watc and we had, as I said before, chose the two bunks at the far end of th focsle, not alone because this woul give us a little more seclusion, bu principally because here we coul better defend ourselves in case of fight, it being impossible for an one to attack us in the rear.

The second day out there develope a great fight between some Irishme and Germans on our watch and bot fists and knives were swinging lus- ily until the second mate came in an separated the fighters, by knockin them down with a copper bolt h was carrying. Five of the men wer stretched out on deck before h stopped and these he threw out o the door, so they would "come to quicker; then he turned and aske if there were any others that had a idea they would like to "start som thing," for if so now was thei chance and he would guarantee t make mince-meat of them in shor order. But no one cared to take chance and this was the first an last time it was necessary for hi to enter our focsle for such a pu pose. Thereafter the men were car ful to stage their fights when h wasn't around. The most of the were a lot of bums anyway, but th mates knew how to make them to the mark and never handled the with silk gloves at any time.

We certainly had good food, warm meal three times a day an plenty of fresh bread; somethin one didn't get in any but these fa American clippers. Yep, we live fine but we had to work hard fo what we got, and I had never u stepped and stepped a topmast b lantern light before I came on thi ship.

At last good luck came my way first, because I could steer the shi so well—in fact on this account Wi liams and I were made quartermas ers and we took turns steering o our watch — secondly, the followin little incident happened:

As I've already told you, we wer having a race with the "Aurora and consequently carried as muc sail as was in any way possible. W were rushing along one night whe began to blow a regular gale be- re we could shorten sail and all ree royals carried away at the me time. Four men were ordered to the fore; four into the main, d two into the mizzen and I jumped r the main rigging, that being my ssignment and started up to spill e wind out of the royal and clew up.

---

[2] This ship was of extreme clipper form. Built by John Taylor at Chelsea, Mass., in 1853, she was owned by Pickman, Silsbee and Allen of Salem, Mass. Two hundred and four feet 2 inches long, 38 feet 6 inches beam, and 24 feet depth, she measured 1396-40/95 tons (old measurement). Ship and outfit cost $83,400. She was sold British in 1863, and burned near Bombay in 1870.

It was pitch dark and raining hard, I couldn't see who else was on e yard arm and not until I had the indward peak secured did I dis- ver that I was alone up there in e air. It took me a long time be- re I managed to get the sail fairly ell clewed up and even then it was possible for me to secure it prop- ly my being alone, yet I fastened well enough so the wind wouldn't ow it away.

When the job was at last finished d I came down the main rigging, e third mate was standing on deck th his lantern to find out who it as coming down. When he saw me shouted, "Where did you come om," and when I told him I came om the main royal, he asked me hat I had been doing there. I told m I had been clewing up the sail, t had been alone and it had there- re taken a long time. "My God, hat a liar you are, you German g," he shouted, "come on down and ll teach you to tell the truth."

I promptly jumped down on deck, ady to settle the argument with m, but just then the mate came ong, and the third mate told him hat I had said and added that it as more than a half hour since e men had come down from the ain royal yard. The mate, Mr. iley, questioned me closely and nally believed me, though he said couldn't understand how one man uld handle that sail alone on such night.

The whole starboard watch was lled out again and after a lot of cking and filling, it was discov- ed that the three other men who d been ordered aloft, had gotten further than the topsail yard, here they had sought shelter and mained for some time and then me down again. All three of them ceived a terrible beating and then d to go up and secure the royal operly anyway. They were given breakfast the next morning and their following watch below, did nothing but run up and down the rigging between the deck and royal, unfurling it the one time and clewing it up the next.

The result was, I was told it wouldn't be necessary for me to go aloft any more, except under special orders, and the rest of the trip I steered and busied myself keeping the poop deck equipment in apple pie order. I considered this a great piece of good luck.

The officers often mishandled the men, but the men really deserved no better than they got, for they were not in any sense "white" men. The most of them were the scum of the lowest dives in Hongkong; dirty, lazy and but very indifferent sailors, and I can assure you that during the first fourteen days, or so, the "Mastiff" was veritably a floating Hell.

We carried an immense press of sail the whole trip and after about sixty days we began to approach the coast of California, and the day that we first saw land, we also saw the "Aurora" a few miles away from us. There was great excitement from then on to see which of us would enter the harbor first and we were greatly disappointed when the pilot boarded us outside the bar and informed us the "Aurora" had passed in a few hours before (1859).

I was very happy as we passed in through the magnificent Golden Gates and anchored in San Francisco's beautiful bay. The ship was hardly anchored before it was overrun with boarding-house runners and we were no sooner made fast to the dock than all hands left the ship, excepting Williams and myself. We remained on board at the suggestion of the mate and the next day I was offered the position of second mate on the ship, but as I wanted to sail on this beautiful coast for a while, I refused the offer with thanks.

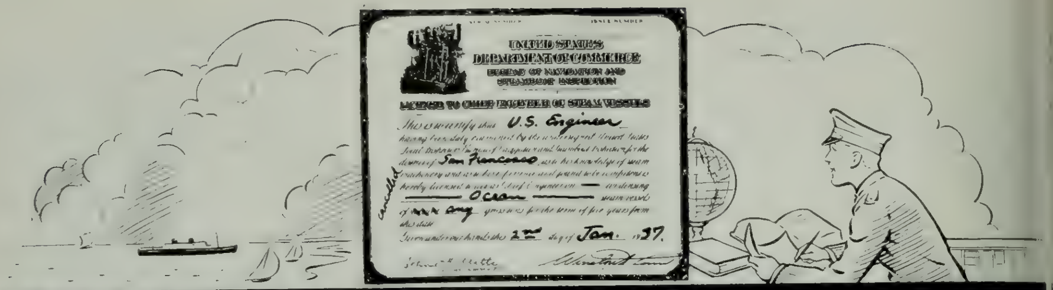
After I left the "Mastiff" and had found lodgings ashore, I paid a visit to the Danish Consul and he invited me to come and live with him, which I did for a while. But not for very long, however, for I soon secured a job as mate on the scow "Veta," Captain Jessen.

A scow is a vessel built almost square, something like a Danish mud scow. The scow "Veta" had two masts and was rigged like a fore and aft schooner; she only drew three feet, two inches when loaded with 3000 sacks of wheat, but she had a centerboard and could navigate and tack, almost as well as any other sailing vessel.

An old San Francisco Bay and river scow schooner.

The first trip we made was up to Sacramento, in fact we made several trips between Frisco and that town. I must tell you that when we tacked up and down the river, we never bothered to heave the lead; all we had to do was to keep an eye on the centerboard and when that started to raise up, then we would come about and start off on the other tack. This type of river scow turned very quickly and often when we came about we would be close enough to the bank of the river to jump ashore. I have often done this and gone up among the gardens along the river and "hooked" for myself a couple of watermelons and then jumped aboard next time the vessel came about on that side of the river.

(Page 58, please)


UNITED STATES
DEPARTMENT OF COMMERCE
BUREAU OF NAVIGATION AND
STEAMBOAT INSPECTION
LICENSE TO CHIEF ENGINEER OF STEAM VESSELS
U.S. Engineer
San Francisco
Ocean
any
2nd Jan. 37.
Cancelled

Your Problems Answered

by "The Chief"

The word "Cancelled" was inscribed on face of the above license at the direction of the Bureau of Marine Inspection and Navigation. As used here it means "Specimen Copy."

GEARS—(Concluded)

QUESTION

Is the pinion made of the same material as the gear?

ANSWER

The pinion is made a little harder than the gear. Assuming proper adjustment of the gears, the wear is proportional to the tooth loading and the number of contacts per minute. The pinion teeth contact more often than the gear teeth in proportion to the ratio of reduction, thus must be harder to prevent increased wear.

QUESTION

Is case hardening or other methods used to harden the surface against wear?

ANSWER

No. On account of the extreme accuracy of cutting the gears needed at the high pitch line velocity used it is impractical to do any machine operations to them after they are cut. No heat treatment is permissible after cutting, due to possible warping and distortion. Cutting would be difficult after surface hardening. The contours are so small that grinding after hardening is impractical. Thus the final hardening and heat treating is done before cutting.

QUESTION

How are the teeth cut?

ANSWER

By a hobbing process, in which a special milling machine is used. The cutter is a worm with slots across the thread to form cutters. The gear to be cut is mounted, axis vertical, on a revolving table, and the worm cutter or hob revolves against it, milling out the tooth contour and being fed downward slowly while the gear revolves.

Small gears are sometimes formed on a specially constructed planing machine.

Great accuracy of motion of all parts of the machine is essential. The division of the circumference of the gear and all other adjustments must be of almost unbelievable accuracy. A cut once started must be continued through as to stop would leave a minute mark on the teeth. Temperatures must not be allowed to change materially. The bearings and fits of the machine must be tight.

QUESTION

What are the essentials of successful operations of a propulsion gear?

ANSWER

Extreme accuracy in cutting the teeth, and maintenance of accurate alignment, are probably the most important.

In rigid gear housing the alignment depends on accurate machine work in boring the bearings and their housings. In the floating frame type of gear support the pinion and its bearings are mounted in a frame supported on flexible I beams which assist in maintaining a uniform distribution of load over the length of the gear face.

The uniform distribution of load over each inch of width of gear is of prime importance. Misalignment and pinion deflection work against this essential factor. While at one time designs were used involving flexible gears made from disks, these have been largely abandoned. No substitute has been found for accuracy of alignment, of cutting, and stiffness of pinion.

Lubrication is the next prime essential. Although it cannot be said that the oil film separates the teeth at contact as it does in the journal and bearing, nevertheless it is an important factor to prevent wear. A heavier oil than desirable for turbine bearings is best for gears. This means a compromise in oil viscosity. Furthermore, the oil for gears is frequently cooled down to a lower temperature than that which goes to turbine bearings, which helps materially.

The oil must be sprayed on the teeth just before or at point of contact over the entire face. This means sprays for the ahead and astern conditions. Oil applied elsewhere on the gear is thrown off by centrifugal force before the teeth contact and is then useless. Small spray holes are to be avoided, as they may plug up. Instead, a large stream of oil, say ⅛ or 3/16 inch diameter, can be directed against a vane to spread it out into a wide, thin film just as the teeth enter contact.

The theory of lubrication of gear teeth is entirely different from that of the journal and bearing. The tooth contact is metal to metal. The oil wetting of the metal prevents scouring and galling of the metal.

QUESTION

Is there a sliding action or relative motion between the teeth of mating gears?

ANSWER

Yes. There is a very slight motion between them, although it is mostly a rolling action. The rubbing effect is towards the pitch line from top and bottom of tooth, or just the reverse, depending on whether the tooth is driving or driven. There is no motion at the pitch line.

QUESTION

Is there any tooth wear in a gear properly designed, cut and operated?

ANSWER

Under normal conditions the gear and pinion teeth should not wear a measurable amount in a very long period of time. Of course, teeth have worn on gear sets, and others probably will wear, but sets have been operated continuously for years without measurable wear. The art of heat treating, hobbing and design has now developed to the stage where a long, satisfactory life of the gears may be confidently expected.

QUESTION

What are some of the troubles which have been experienced with gears?

ANSWER

Classified from the noise emitted, we have the following:

When an obnoxious sing is evident, it usually means misalignment to be corrected. Also, it may mean the pinion pitch circle is not concentric with the shaft journal. This requires that the pinion be rehobbed.

When the gear sounds rough or rumbles it may be misalignment, but more likely is incorrect spacing of the teeth, which means they must be rehobbed.

If the noise is a knock or pound it means an injured tooth. The injury or bump may be removed or smoothed out. The deformity of one tooth rapidly spreads to injuring the others.

If they whistle it is probably due to a poor job of cutting and they must be rehobbed.

QUESTION

What is pitting and its effect?

ANSWER

During the first year of operation of a new set of gears there is often observed a pitting action, wherein small flakes of metal break out of the surface of the teeth, leaving depressions which may be from the smallest point in size to as large as 3/16 inch in diameter and usually less than 1/32 inch deep. Generally these pits occur at the pitch line where only rolling action takes place.

Experience shows that after the first year this pitting action stops and no further trouble develops from them. They account for the metallic particles found settled out of the oil in the bottom of the gear case.

QUESTION

What is scoring due to?

ANSWER

Failure of oil supply, even for a few moments, may cause a galling or scoring of the polished tooth flank. If the damage is not too great the gear may be saved by rehobbing. Filing or hand stoning of gear teeth is not to be recommended. The possible good to be accomplished is small, and there is a great hazard of much damage in changing the tooth shape.

Scoured gears have been repolished by lapping. This is a process of running them at no load, slow speed, and applying a mixture of ground glass and oil. There is danger to the bearings and other parts in this lapping process, and it should not be undertaken except in the presence of experts, preferably in the shop.

A thin, sharp feather edge on the tip of the tooth may be noticed. This may be quite normal, and little will be accomplished in removing it.

QUESTION

What general precautions should be observed in operating a propulsion gear?

ANSWER

The first necessity is a continuous supply of cool, clean, acid free oil. Corrosion or rust of parts may be due to water or acid oil.

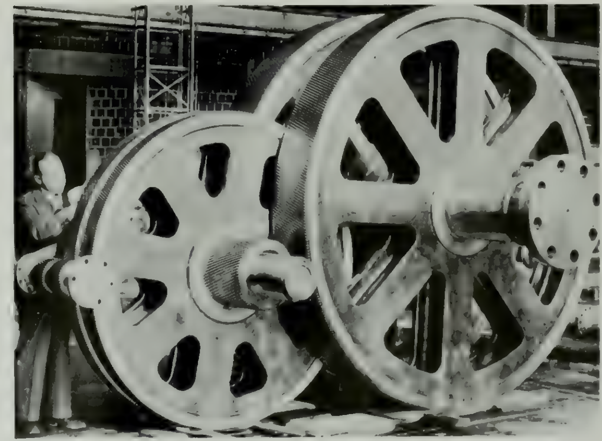
An excellent precaution is to leave the gears alone, opening up only for inspection. Avoid naked lights when opening a hand hole cover, as the gears usually make an explosive vapor of the oil.

Be alert for abnormal or uneven bearing temperatures, as a damaged bearing may injure the gears.

Flexible couplings require lubrication. If it fails they will wear, but, more serious, may cause a transmission of thrust from main thrust to pinion or turbine thrust bearing. This is because the gears are positioned axially by the main thrust while the turbine is located by its thrust bearing, and little or no thrust must be allowed to pass through the flexible coupling.

Changes in the sound of the gears should be noted, perhaps logged for investigation at the first opportunity.

Our next article will discuss some considerations regarding electric propulsion of ships.



A set of double reduction pinions and gears for a marine turbine.

Book Reviews

- **Systematic Location of Diesel Engine Troubles. A wall chart arranged by Victor W. Page, M.S. A.E. Published by Norman W. Henley Publishing Company, 2 West 45th Street, New York City. Size, 25 inches by 38 inches. Price 50c. Printed in two colors.**

The increasing use of automotive diesel engines and the numerous applications of small and medium powered engines operating on the compression ignition principle, to industrial uses as well as for transportation, makes this new chart a particularly timely publication. It is intended for shop, school and garage use and is a valuable guide to diesel engine trouble shooting. The chart has sectional views, longitudinal and transverse, of a typical modern light diesel engine as well as diagrams of a fuel supply system, including the feed pump, the injection pump and the fuel injector. The type is large, clear and easily read.

All mechanical parts are clearly indicated by arrows and named, and the accompanying tabular matter summarizes the various defects apt to occur, the symptoms that indicate the defective condition and the remedy for the trouble. To make the search easy for the mechanic, the troubles are summarized under easily recognized faulty action such as lost power, hard starting, misfiring, noisy operation, reasons for different color of exhaust smoke, etc. As the diesel engine differs materially in operating principle from gasoline engines, such a chart should prove useful in all shops and garages catering to both types. It is also excellent for vocational and trade schools and the general mechanic.

Engineers' Licenses

The following list shows the licenses granted during the month of February to engineer officers of the merchant marine at Pacific Coast offices of the Bureau of Marine Inspection and Navigation. For key to abbreviations see footnote.

Name and Grade	Class	Condition
SAN FRANCISCO		
Frederick M. O'Neill, Chief Eng.	OSS, any GT	RG
George K. Wong, Chief Eng.	OSS, any GT	RG
Adam P. Talmadge, 1st Asst. Eng.	OSS, any GT	RG
Howard C. Manley, 2nd Asst. Eng.	OSS, any GT	RG
Randell H. Maddox, 2nd Asst. Eng.	OSS, any GT	RG
Robert J. Proelss, 2nd Asst. Eng.	OSS, any GT	O
Kenneth R. Madison, 2nd Asst. Eng.	OSS, any GT	O
Raymond L. Cooper, 3d Asst. Eng.	OSS, any GT	O
William Coughlin, 3d Asst. Eng.	OSS, any GT	O
Daniel H. Donaldson, Jr., 3d Asst. Eng.	OSS, any GT	O
William J. Collins, Chief Eng.	OMS, any GT	O
James F. Wishart, Chief Eng.	OMS, any GT	O
SAN PEDRO		
Schuyler E. Davis, Chief Eng.	OSS, any GT	RG
Harry D. Norman, Chief Eng.	OSS, any GT	RG
Francis R. Freeburg, 2nd Asst. Eng.	OSS, any GT	O
Lenox S. Irwin, 1st Asst. Eng.	OSS, any GT	RG
Joseph Turnauer, 3d Asst. Eng.	OSS, any GT	O
Homer W. Van Horn, 3d Asst. Eng.	OSS, any GT	O
Jacques B. Morgan, Chief Eng.	OMS, 500 GT	O
HOQUIAM, WASH.		
Harry L. Andersen, 2nd Asst. Eng.	OSS, any GT	
Harlan J. Eggleston, Chief Eng.	OMS, 750 GT	
3d Asst. Eng.	OMS, any GT	
SEATTLE		
Richmond J. Norton, Chief Eng.	OMS, any GT	O
Chas. H. Hayes, Jr., 1st Asst. Eng.	OSS, any GT	RG
William H. Southerland, 1st Asst. Eng.	OSS, any GT	RG
Samuel K. Allison, 2nd Asst. Eng.	OSS, any GT	RG
Joseph McNulty, 3d Asst. Eng.	OSS, any GT	O
PORTLAND		
Timothy J. Ahern, Chief Eng.	OMS, 500 GT	O
Bedford L. Burnett, Chief Eng.	OMS, 500 GT	O
Richard M. Floyd, Chief Eng.	OMS, 300 GT	
1st Asst. Eng.	OMS, 450 GT	O
Helmer L. Paulson, Chief Eng.	OMS, 300 GT	
1st Asst. Eng.	OMS, 450 GT	O
Sidney C. Fredricksen, Chief Eng.	OMS, 300 GT	
1st Asst. Eng.	OMS, 450 GT	O
Knight Knowles, Chief Eng.	OMS, 300 GT	
1st Asst. Eng.	OMS, 450 GT	O
Walter A. Nagely, 2nd Asst. Eng.	OSS, any GT	RG
Wm. F. D. Dernier, 3d Asst. Eng.	OSS, any GT	O
Carl Edward Hawkins, 3d Asst. Eng.	OSS, any GT	O
Henry F. Weissenfluh, 3d Asst. Eng.	OSS, any GT	O

Abbreviations: GT is gross tonnage; RG is raised grade; O is original license; OSS is ocean steamer; OMS is ocean motorship.

Ports of Southern New England, compiled by the Board of Engineers for Rivers and Harbors, War Department, and the United States Maritime Commission, and published as Port Series No. 18 by the Superintendent of Documents, Government Printing Office, Washington, D. C.; price $1.25.

Reports in this series cover the principal ports of the United States and are prepared to meet the needs of the Government and to supply data for use of importers, exporters, manufacturers, railroads, steamship lines, and others interested in the development of harbors and the establishment of port facilities.

The present report is a revision of the data published in previous issues, and gives information with regard to port and harbor conditions; port customs and regulations; services and charges; fuel and supplies; and the facilities available for service to commerce and shipping, including piers, wharves, storage war houses, bulk freight storage, di docks and marine railways, marin repair plants, floating equipment, an wrecking and salvage facilities. Rai road and steamship lines are di cussed and information present regarding their charges and pra tices in connection with termin service. Tables are presented show ing in detail the foreign and dome tic waterborne commerce at the po during the period 1926-35.

For American Deck Officers

Rise of a Vessel Passing from Fresh to Salt Water

With regard to the amount a ves- el would rise in passing from fresh, r partly salt, to salt water, the fol owing table shows approximately, in elation to the molded depth, the mount vessels of different types nd different depths would rise in assing from fresh to salt water:

Approximate amount of "rise" in passing from fresh to sea water

olded Depth in Feet	Vessels without Deck Houses ins.	Awning deck Vessels ins.	Spar Deck Vessels ins.
and under 8.	1½		
" " 11	2		
" " 13.	2½	—	—
" " 16	3	3½	4
" " 19	3½	4	4½
" " 22.	4	4½	5
" " 25	4½	5	5½
" " 28	5	5½	6
" " 31	5½	6	6½
" " 34	6	6½	7

The weight of a cubic foot of salt ater is taken, in the above table, to 4 lbs., and that of fresh water 2.5 lbs.

In vessels of extremely full or of xtremely fine form, this table does ot strictly apply, as it is necessary such cases to have the displace- ent diagram of the vessel to esti- ate the exact amount of rise. For ll vessels the load line requires that he fresh water line as well as the alt water line shall be marked on he vessel's sides and inserted on the ad line certificate. In order to esti- ate the amount of "rise" of a ves- el passing from partly salt to salt ater the density of the water must be known.

If the exact amount of rise on proceeding to sea is required, it is necessary for the water to be tested by means of a hydrometer, an operation which can be performed in a few minutes, and by which the number of ounces of salt in a cubic foot of water is found. When this information is obtained, the rule above-mentioned can be used.

Use of Oil for Modifying the Effect of Breaking Waves

The following may serve for the guidance of seamen, whose attention is called to the fact that a very small quantity of oil, skilfully applied, may prevent much damage both to ships (especially the smaller classes) and to boats, by modifying the action of breaking seas.

The principal facts as to the use of oil are as follows:

1. On free waves—i.e., waves in deep water, the effect is greatest.

2. In a surf, or waves breaking on a bar, where a mass of liquid is in actual motion in shallow water, the effect of the oil is uncertain, as nothing can prevent the larger waves from breaking under such circumstances, but even here it is of some service.

3. The heaviest and thickest oils are most effectual. Refined kerosene is of little use; crude petroleum is serviceable when nothing else is obtainable; but all animal and vegetable oils, such as waste oil from the engines, have great effect.

4. A small quantity of oil, if applied in such a manner as to spread to windward.

5. It is useful in a ship or boat, both when running, or lying to.

6. No experiences are related of its use when hoisting a boat up in a seaway at sea, but it is highly probable that much time and injury to the boat would be saved by its application on such occasions.

At anchor, when the sea is sufficient to render it difficult to hoist up, or in boats, oil bags from forward or from the swinging booms have been found to render the sea alongside comparatively smooth.

7. In cold water, the oil, being thickened by the lower temperature, and not being able to spread freely, will have its effect much reduced. This will vary with the description of oil used.

8. The best method of application in a ship at sea appears to be: Hanging over the side, in such a manner as to be in the water, small canvas bags, capable of holding from one to two gallons of oil, such bags being pricked with a sail needle to facilitate leakage of the oil.

The position of these bags should vary with the circumstances. Running before the wind they should be hung on either bow and allowed to tow in the water.

With the wind on the quarter the effect seems to be less than in any other position, as the oil goes astern while the waves come up on the quarter.

Lying to, the weather bow and another position farther aft seem the best places from which to hang the bags, with a sufficient length of line to permit them to draw to windward, while the ship drifts.

9. Crossing a bar with a flood tide, oil poured overboard and allowed to float in ahead of the boat which would follow with a bag towing astern, would appear to be the best plan. As before remarked, under these circumstances the effect cannot be so much trusted.

On a bar with the ebb tide it would seem to be useless to try oil for the purpose of entering.

10. For boarding a wreck, it is recommended to pour oil overboard to windward of her before going alongside. The effect in this case must greatly depend upon the set of the current, and the circumstances of the depth of water.

11. For a boat riding in bad weather from a sea anchor, it is recommended to fasten the bag to an endless line rove through a block on the sea anchor, by which means the oil is diffused well ahead of the boat, and the bag can be readily hauled on board for refilling if necessary.

12. Towing a vessel in a heavy sea, oil is of the greatest service, and may prevent parting the hawser. Distribute from the towing vessel forward and on both sides; if used only aft, the tow alone gets the benefit.

Monthly Review of Tanker Market

By Oscar J. Beyfuss

You will notice a dearth of charters and in general a downward trend both in voyage and in consecutive charters in this review of the past month's business.

TIME CHARTERS

No new charters in this department.

VOYAGE CHARTERS

AMERICAN — Gulf to North of Hatteras: This trade has reached the usual seasonal doldrums; fuel oil rates are down to 21c, light crude 18c, while heating oil fixtures are being made in the neighborhood of 24c.

Intercoastal: Nothing new.

FOREIGN — Gulf to U.K./Continent: Clean fixtures were down to 31/-, 30/- and 27/6, while dirty fixtures declined to 26/6 and 26/-.

California to U.K./Continent: No new transactions reported.

Black Sea to U.K./Continent: Clean fixtures declined to 28/- and one w done at 27/-. Dirty charters were a nounced at 26/-.

California-Australia and New Ze land: No transactions.

California-Orient: A clean rel gets 29/- for two voyages to Japa Dirty fixtures to Japan dropped 27/6 and 25/- for single voyage Several boats were taken on conse utive voyages of about a year's du ation in the narrow range betwe 20/- and 23/-.

Change of Masters

Steamer Kansan: L. C. Hansen; vice, H. Rogers.
Steamer Charles L. Wheeler, Jr.: Peter Lund; vice, H. Danskannon.
Steamer George L. Olson: Neil C. Ronberg; vice, P. J. C. Johnson.
Steamer Point San Pablo: N. A. Nielsen; vice, Peter Lund.
Motorship Alaska Standard: Karl R. Anderson; vice, A. H. Koskin.
Steamer West Planter: H. Danskannon; vice, L. Prendle.
Steamer Florence Olson: P. J. C. Johnson; vice, John Lund.
Motorship Missourian: O. M. Rogers; vice, C. E. A. Anderson.
Steamer Absaroka: O. P. Carson; vice, John Foldat.
Steamer Columbian: W. I. Stevens; vice, F. J. Butler.
Steamer Mexican: R. A. Oliver; vice, W. O. Brown.

Deck Officers' Licenses

The following list shows the licenses granted during the month of February to deck officers of the merchant marine at Pacific Coast offices of the Bureau of Marine Inspection and Navigation. For key to abbreviations see footnote.

Name and Grade	Class	Condition
HONOLULU		
Gregory J. Hatch, Chief Mate	OMS and OSS, any GT	RG
SAN FRANCISCO		
Walter L. Sorenson, Master	OSS, any GT	RG
Herman R. Hiers, Master	OSS, any GT	RG
Thelbert D. L. Arthur, Chief Mate	OSS, any GT	RG
Connie F. Kubilus, Chief Mate	OSS, any GT	RG
John P. Gately, Chief Mate	OSS, any GT	RG
Walter C. Bindt, Chief Mate	OSS, any GT	RG
Henry A. Shutz, Chief Mate	OSS, any GT	RG
Charles W. Brockway, Chief Mate	OSS, any GT	RG
Halvar O. Lindgren, Chief Mate	OSS, any GT	RG
David B. McMichael, 2nd Mate	OSS, any GT	RG
Matthew J. Richards, 3d Mate	OSS, any GT	O
SAN PEDRO		
Joseph C. Chambers, Master	OSS, any GT	RG
Einar N. Eriksen, Master & Pilot	OSS, any GT	RG
Edgar M. Harrison, Master & Pilot	OSS, 100 GT	RG
Lester F. Snyder, Master	OSS, any GT	RG
Rodolphe L. Gendron, 3d Mate	OSS, any GT	O
Edward W. Hollis, 2nd Mate	OSS, any GT	RG
Elwin W. Jenkins, 3d Mate	OSS, any GT	O
SEATTLE		
Theodore G. Jacobsen, Master	OSS, any GT	RG
Harold Pederson, Master	Coastwise SS, any GT	O
Erwin P. Larson, Chief Mate	OSS, any GT	RG
Alfred J. Polyblank, Chief Mate	OSS, any GT	RG
Hans S. Ryning, Chief Mate	OSS, any GT	RG
Everett E. Branstetter, 2nd Mate	OSS, any GT	RG
J. Holger Christensen, 3d Mate	OSS, any GT	O

Abbreviations: GT is gross tonnage; RG is raised grade; O is original license; OSS is ocean steamer; OMS is ocean motorship.

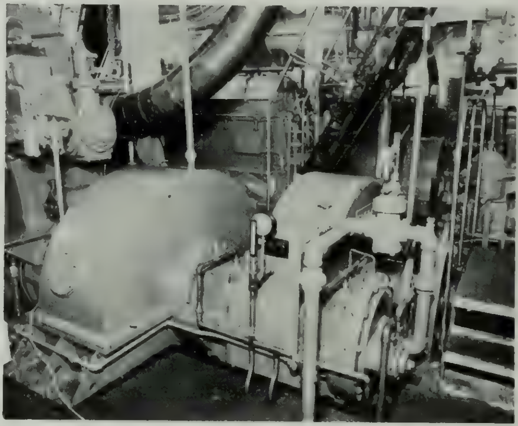
Geared Diesel Drive for Marine Propulsion

crease in propeller efficiency iu to higher operating speeds is pa icularly noticeable on tugs. In ably no other class of service slow propeller speeds so import- an Many tug operators have re- ai ed the steam plants solely be- a e they felt that to replace them vi diesels would compel them to a ifice splendid towing qualities es lting from the 90-125 r.p.m. of h steam engine. Others have made o ersions, but reluctantly admitted h they hated to give up the slow p d wheel. Still others, and in a idly increasing numbers, replaced h steam plants with diesels, but ided suitable reduction gears be w n the engines and the wheels.

typical tug that has been con- e d from steam to diesel-gear ri is the 102 foot Syosset, built o years ago and used for many e s on the Hudson River by the o Island Railroad Company. Her ri nal power was a 19", 40"x28" o pound steam engine rated at 700 H . For nearly 35 years the steam o r in her performed dependably y 1933 it was definitely obsolete.

out 1934 the Syosset was sold e Townsend Petroleum Trans- Corp., of Bayonne, N. J., who e in need of a powerful tug. One eir first moves was to completely ild and repower the vessel. Capt. nsend, president of the firm, a and still is a strong believer w wheel speeds. It was not sur- ing, in view of that, when he lled a 540 H.P. Superior Diesel d between the engine and the peller a Farrel-Birmingham ght line reduction gear. The 300 . engine speed was thus reduced 0 r.p.m. at the wheel—a highly ient speed, and a speed at which full power of the engine could ade effective in towing effort.

e Farrel reduction gear in the et is worthy of comment be- at the time it was installed it died many features unusual to the marine industry. It is of the straight-line type, which makes possible keeping the crankshaft of the engine and the propeller shaft on the same plane. Two pinion gears mesh with the driving gear, and in turn the pinion shaft gears mesh with the gear on the propeller shaft. Herringbone, continuous tooth gears are used, and built into the gear case is an anti-friction, roller type thrust bearing. This type of gear set has been built by Farrel for years and used on the cutter head drives of many large suction dredges. The recently built Army Engineer Corps dredges are each equipped with this type reduction gear on their cutter head drive shafts.



Close up of one of the Farrel Birmingham offset type speed reducing gears on U. S. Army Engineers dredge Pacific. This arrangement not only allows a more favorable propeller speed but also provides room between the two Winton propulsion diesels for a diesel engine generating set between the two main propulsion units.

Another example of a modern diesel-gear driven, converted vessel is the tanker Dolomite II, which is now powered with two 720 H.P. McIntosh & Seymour Diesels. These engines turn 600 r.p.m. and drive their propellers through Farrel horizontal offset reduction gears. In this case it was found advantageous to keep the propeller shafts and the crankshafts on the same vertical plane, but to offset the horizontal plane. This made possible placing the two engines considerably closer together than if they drove through straight line or vertical offset reduction gears. Additional space was thus provided for auxiliary machinery in the engine room wings. It is estimated that the medium speed diesels and reduction gear drive in the Dolomite II eliminated 65,000 pounds of machinery weight. This represents an increase in cargo capacity of 32½ tons. Multiply that number of tons by the freight rate per ton, and again by the number of trips the vessel will make during the nine-year period under which she is now chartered—and there is a sizable bonus income attributable entirely to the Farrel reduction gears.

The Syosset and the Dolomite II are but two of many vessels that in recent years have replaced obsolete machinery with lighter weight, more economical medium speed diesel engines—but which have not sacrificed the advantages of slow propeller speeds in so doing because of the reduction gears with which they are equipped.

Why Capital Lacks Confidence in Shipping

By S. A. Oyen

This article is the substance of a radio address broadcast by Mr. S. A. Oyen from Station WOR in New York recently. Mr. Oyen has had considerable personal experience with shipping and in recent years has conducted expert research surveys into several phases of American shipping. He is well qualified to speak on the subject in hand.

During 1933-1934, I made an exhaustive survey of **Domestic Water Transportation** for Mr. Joseph B. Eastman, then Federal Coordinator of Transportation. In my report I said, "The water transportation industry is sick, almost to death, and requires heroic remedies." Also, again quoting from my report, "These figures (referring to the age of the ships) speak eloquently of the condition of the equipment and indicate a very urgent need of rejuvenation through new replacements—the natural course of events will compel the withdrawal of many ships—reducing service."

At the same time I made a deep, but unofficial, probe into our foreign shipping; my findings given in a private report conveyed the fact that the same sickly and anemic condition existed in our foreign trade fleet. But this talk is only concerned with our domestic shipping—intercoastal and coastwise—a branch of the industry that has no articulate advocate.

Any investor, casting about for a sound investment, passes over the shipping field. Who can blame him? There is no reasonable assurance he can get his money back. Still, there is a very strong need for public financial participation. Unless and until the industry can be stabilized, the prospects of obtaining investment funds to maintain the industry in full bloom as a private enterprise are less than nil. The only alternative is public ownership, which we all hope can be avoided. Were the I.C.C. Act repealed, restoring the wild railway competion and discrimination that existed prior to its passage, there would be no public funds available for railroad uses, yet that is almost the condition shipping is in today.

The mortality rate of shipping companies is very high. Is it any wonder that investors avoid shipping? In the absence of any effective remedies, the mortality rate of shipping companies during the next five years will be so great that the various services will be all but decimated. To emphatically illustrate the obsolescence of our fleets, I wish to give at this point the average age of ships in a few important common carrier services:

Atlantic Coastwise	28 years
Gulf Intercoastal	19 years
U.S. Intercoastal	20 years
Great Lakes	33 years
Pacific Coastwise	28 years

The normal, sound, economical life of ships is 20 years. There is, however, no restriction against the operation of a ship older than 20 years, so long as she meets steamboat inspection and the Classification requirements, but these may demand such large expenses to meet with the requirements as to make it economically and financially unsound to continue operation.

There are today no funds of any moment, now earmarked or availab for new construction in any of tl trade routes that I just mentione True, some companies have informa plans for new shipbuilding, but the are contingent upon securing func or finding some assistance not no available.

If the various common carrier se vices, upon which the public now re lies for transportation, are to b maintained, there must be started a once a large building program to pro vide fast, modern and economica ships to carry on the services. Ther will then be offered opportunities fo the investment of large sums o money. None in the industry is s naive as to believe that private cap tal can be had under the condition as they exist at present.

To pave the way for the attractio of private capital into shipping, sev eral things must first be done, an even then the results may be nega tive.

● 1. Regulation of Rates.

At present there exist varying de grees of regulation, in the same trad route, from the strictest to none a all. Such a condition creates inequa lities among competitors and chao among patrons. Some steamship line owned by the railroads are require to operate under as complete regula tion as the railroads themselves Other lines, having through water rail rates, are regulated only as t that traffic; still other lines operat only on a port to port basis and ar let off with a nondescript regulation To add to the confusion, many agen cies of the Government have some au thority over shipping. All the govern mental powers over shipping shoul be consolidated into one agency fo ff tiveness and a continuity of pol- cy thereby avoiding conflict. Mani- esy, a mixed regulatory condition r uces competitive unfairness and nf cts losses on both the lines and he shippers.

cure such abuses, there must be at regulation of **all the ships in the ra e**, thereby assuring stability, cer- ai y, and also preventing discrim- na on. The Eastman Water Bill, o before the Congress, has the u and ought to have wide public upport.

ithout the stabilizing effect of e lation, there is not even a gamb- er chance of the lines making pro- e earnings. It is, therefore, too u h to ask capital to risk its funds hipping until an effective stabil- za on has been accomplished.

Regulation of Trade Routes.

here must be regulation of the ra e routes to control the number f hips in operation. Obviously, a ra e lane that has only enough busi- e for ten ships which operate on ix , regular and frequent schedules n meet all trade requirements, can- o support fifteen ships. Overton- a ng inevitably results in rate cut- in which is disastrous to all con- e ed; the lines cannot make money, e e the service and facilities must e eglected. When new replacements r due, there are no funds on hand o that purpose, so that the facili- ie and services established and dedicated for public use are allowed to deteriorate, followed by a curtailment, if not an abandonment of service. The public has a right to expect a continuity and an improvement of essential services which are impressed by the public needs. Shipping is as much a public service or utility as the telephone, the gas company or the railroad. We have an established doctrine that utilities are entitled to a reasonable fixed return on their capital invested. The public service companies for that reason in the past enjoyed the confidence of investors and have had access to private capital funds; not so with shipping.

● 3. Regulation of Labor.

Means must be provided to insure a permanent peace in the industry and eliminate as far as possible the necessity for strikes. Maritime labor has gained its objectives. A wise leadership as well as the ranks must now settle down with shipowners to a faithful observance of mutual obligations in their contractual relations. The seaman is as anxious to avoid loss to his earning power as is the shipowner, and rare indeed would be the grievance that could not be settled around a table by mediation.

Therefore, to give legal force to the suggestion, a Maritime Mediation Board should be created to handle all disputes between seamen and shipowners, with the avowed purpose of preventing a stoppage of work and composing differences. Delay is a great healer and will be an effective means of cooling hot tempers and helping find a solution of many disputes without the need of strikes. It has been suggested that this work be done by the Railway Mediation Board; no matter by whom it is administered, the legal machinery must be set up. Adoption of this suggestion will be a long step forward and will remove another barrier to the confidence of investors.

These thoughts are offered as a means of promoting further public discussion. This whole question is the public's concern, and they must be fully informed of the dangers ahead. Our legislators must likewise be duly impressed, so that they will move to relieve the danger.

In the event private capital should still find shipping investments unattractive, even after these suggestions were effective, then the only alternatives are either the extinction of our domestic water services or a 100% financing of needed new ships with Government funds in order to maintain our essential domestic water services.

The fate of an important industry, vital alike to our national defense and commerce, hangs in the balance. It is inconceivable that the industry will be allowed to perish. If the best thought is concentrated on the problem, a satisfactory solution will be found.

The Merchant Marine Act of 1936 was designed to stimulate shipbuilding. So far the only result in actual construction for purely merchant marine purposes is the passenger liner building at Newport News to run alongside the S.S. Manhattan, shown above.

Maintenance Jobs for

Ship and

Shop Procedure in Special Repairs on Marine Machinery

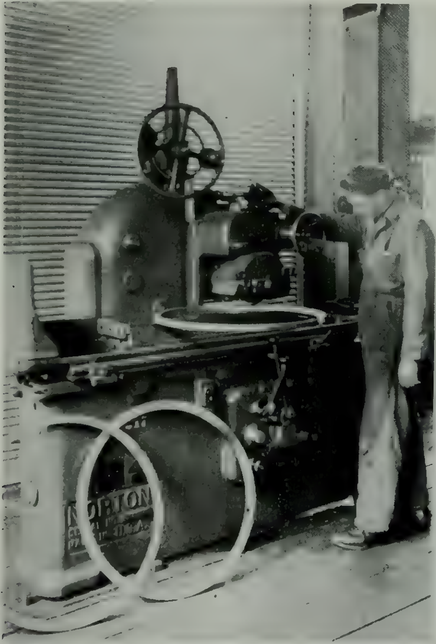


Fig. 1, upper lef
Norton 10 by 36 inc
hydraulic surface grinc
er on diesel pisto
ring work.

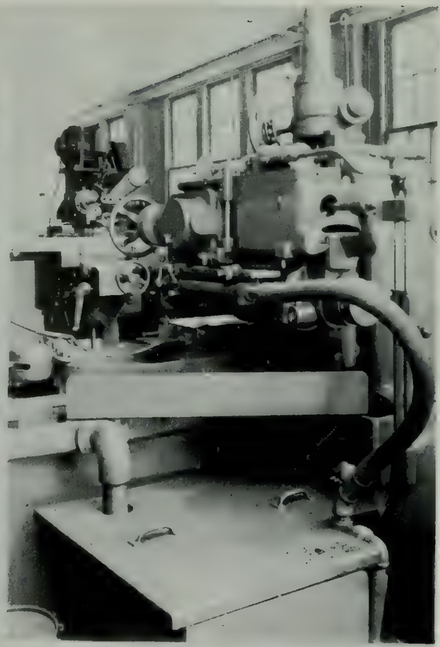


Fig. 2, upper righ
Rear view of surfac
grinder, showing tan
and motor compar
ment.

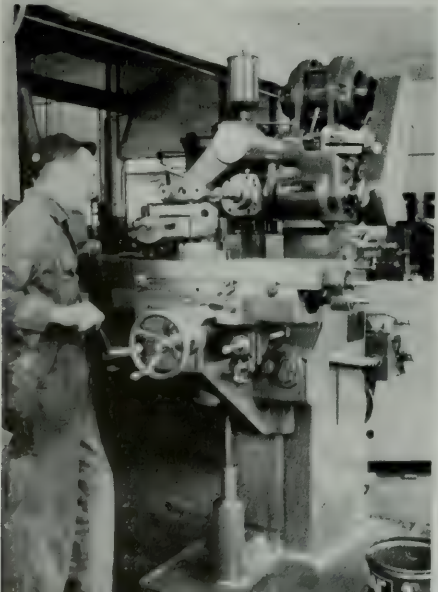


Fig. 3, lower left: Va
Norman No. 32 un
versal milling machin
on vise work.

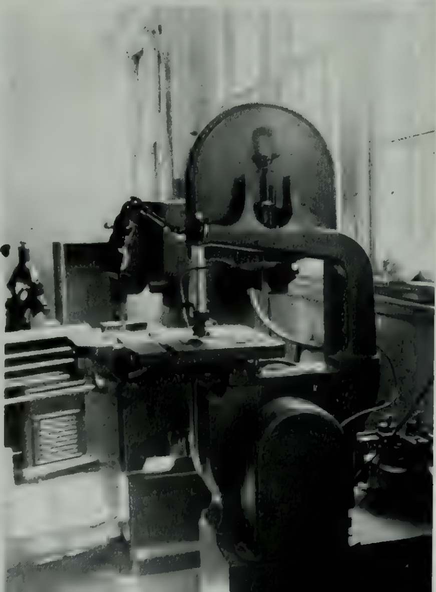


Fig. 4, lower righ
Grob Bros. metal ban
saw; filing machine i
the rear.

Shore

he General Engineering & Dry Dk Co. operates a large shop at S Francisco, a shipbuilding and dr dock plant at Oakland, and a shbuilding and dry dock plant at Almeda. This firm has achieved a ne reputation for the prompt and efcient handling of routine and errgency repairs to ships and thr machinery and for thorough ar speedy maintenance work.

he San Francisco shop is known al as a plant well able to underta the building of special machiner or the execution of machine work to ery close tolerances. The policy of the General Engineering & Dry Dk Co. management leads to a cstant improvement in the tooling ar the working conditions in this shp.

ecent additions to the plant eqipment include some of the lates types of grinding and milling mhines, metal cutting saws, and aumatic filing machines. Several ofhese recent additions are illustred herewith. Among these is the Nton 10 inch by 36 inch hydraulic uface grinding machine shown in Fs. 1 and 2.

me rather novel work has been hdled on this machine—for exampl the finishing of large piston rigs by holding on the magnetic chck as illustrated in Fig. 1. These rigs were for a diesel engine and we 29 inches in diameter.

hey were first rough ground on th sides to within .0005 inch, then ret on the chuck and reground to ext thickness, no variation in hkness being found by application of micrometers at numerous points abt the circumference.

he rings had to be placed in three ferent positions in covering the ere surface with the wheel. Yet variation in thickness could be nd in spite of the fact that after shing the face for one-third of h distance around the ring had to eurned on the chuck to permit anr third of the face to be ground, an so on.

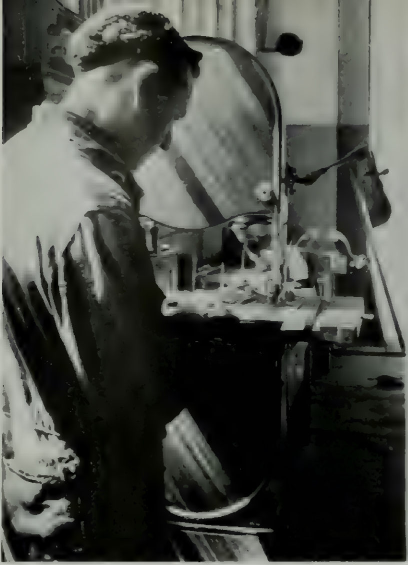


Fig. 5, left: Cutting a shim on the band saw.

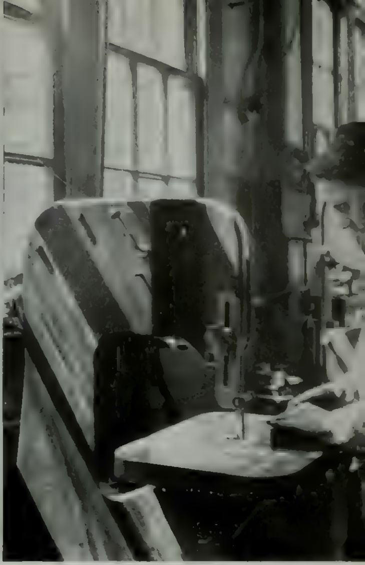


Fig. 6, right: Operation on continuous filing machin

The rear view shows the manner in which the wheel head cross slide is mounted in horizontal dovetail ways in the vertical slide which travels up and down on ways on the massive post secured to the base of the grinder.

The Van Norman milling machine in Fig. 4 set up on a groove milling job is a No. 32 universal having the greatest range of any of this make of millers. The work in the vise at the time of photographing the machine was a medium small piece requiring a narrow channeling cut, but the range for large work is indicated clearly by the length of table, which is 55 inches, and the column height and height of machine from floor to spindle—or 57 inches.

The flexibility of this design now makes it possible with this size of machine to bring the cutter into action on an exceptionally wide area without moving the work. Thus it can handle large jigs and dies, special fixtures and many other classes of work requiring large table area and long feed range longitudinally, in-and-out and vertically.

The construction provides especially for "rangy" work, as indicated by the heavy column, knee, saddle and table. Spindle speeds range up to 1100 per minute and table feeds to 12 13/16 inches per minute.

Two Grob Brothers machines are illustrated in Figs. 4 to 6. The one in Fig. 4 in the foreground, and in Fig. 5, is a metal band saw seen in operation cutting out sheet metal shims. The machine is equipped also with a brazing device for internal work, the brazing outfit being located at the rear on the base of the machine. It is an electric device on which saw bands up to $1\frac{1}{2}$ inches wide can be brazed.

The Grob continuous motion filing machine is represented in Fig. 6. It carries a band of files moving in one direction only, making a continuous cut. It is here seen in use finishing the edges of a metal block requiring perfectly square, smooth surfaces.

The chips are, of course, carried downward, leaving no burr whatever, and consequently the operator can file accurately to the center of a line. The machine is quickly set up for a job and different shaped files can be used for external as well as internal filing. The file chains are of self-locking design, easy to assemble.

The drive is positive and obtained through a series of equally spaced drive pins mounted in the lower sheave and matching with the links of the chain. These drive pins are located at the center of the groove in which the chain operates and are cushioned by helical springs so that they adjust themselves properly to the links of the chain, insuring a positive drive, yet not stretching the chain in any way.

The tension on the file chain is maintained properly by the upper sheave being fastened to a hinged bracket which is held in position by a long extension spring. This tension is released by a lever, shown at the upper left side of the machine, when the file chain is to be opened. The lever acts upon a cam which pushes the upper sheave downward.

On the Ways—

SHIPS IN THE MAKING

LATEST NEWS FROM AMERICAN SHIPYARDS

Navy Launchings and Deliveries

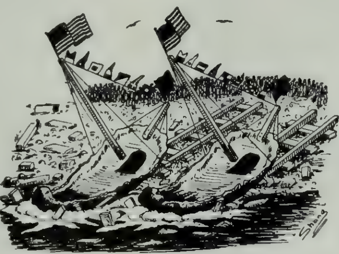
On March 12, at the yard of the New York Shipbuilding Company, Camden, New Jersey, a 10,000 ton displacement cruiser was christened Phoenix and launched into the Delaware River. New York Shipbuilding Company have under construction, in addition to the above, two sister cruisers, one destroyer tender, and one seaplane tender.

On March 15 Mare Island Navy Yard, California, launched the submarine Sturgeon. Under construction, Mare Island has also two harbor tugs and a garbage lighter.

On March 7 the U.S. Navy Yard at Charleston, South Carolina, launched a large harbor tug. The Portsmouth, New Hampshire, Navy Yard reports the completion of the submarine Snapper on March 1 and the commissioning of the submarine Stingray on March 15. Four other submarines are under construction at Portsmouth.

The Electric Boat Company, Groton, Connecticut, on March 15 delivered to the U.S. Navy the submarine Salmon. Electric Boat Company has under construction or on order seven other submarines.

AHOY!



The above whimsical drawing graced the front of a formal invitation issued by General Foods Corporation to a double launching of oyster boats building at the Thomaston, Maine, yards of the Morse Boatbuilding Corporation on Thursday, March 17.

These boats are to be operated by the Bluepoints Company, Inc.

Mrs. Joseph B. Glancy acted as sponsor for one boat, which she christened Harvester. The other boat was sponsored by Mrs. Paul O. Mercer and christened General.

Important Keel Laying

The most important keel laying of the past month occurred on March 15 at the Chester, Pa., yard of the Sun Shipbuilding and Dry Dock Company. The master tanker builders on that date laid the keel for Hull 172, the first of the big, fast tankers contracted for by Standard Oil Company of New Jersey and the U. S. Maritime Commission. These hulls will be 526 feet long, 75 feet beam, and 39 feet depth, and will have 16,300 tons deadweight capacity.

Sun Shipbuilding and Dry Dock Company now expect to deliver on June 1, 1938, the tanker they are building for the Tide Water Associated Oil Company. This ship is very similar to the tankers W. H. Berg and H. D. Collier, built by this yard and recently delivered to the Standard Oil Company of California.

The Sun yard has now on order or under construction seven large tankers.

American Shipbuilding Progress

Work on the two bulk lake freighters is progressing on schedule at the Cleveland yard of the American Shipbuilding Company. These vessels are for the Pittsburgh Steamship Company. They are 610 feet long, 60 feet beam, 32 feet 6 inches deep, and are single screw geared steam turbine drive with two water tube boilers supplying steam at 400 lbs. pressure. Both will be delivered April 15, 1938.

Barge Construction Schedule

The American Bridge Company, Pittsburgh, Pa., has under construction ten cargo barges 132 feet by 35 feet by 10 feet for the Campbell Transportation Company. Beginning on the 15th of April they will deliver a barge every two weeks thereafter.

Federal Launches Another Tanker

On March 19 the Federal Shipbuilding & Dry Dock Company of Kearny, N.J., launched an Isherwood Arcform tanker hull for the Standard

Company of New Jersey and
istened her Esso Boston. She is
12,800 deadweight ton capacity and
13½ knots speed, which now
ms about standard for commercial
erican coastwise tankers.
ederal now have under construc-
n six large tankers and five tor
do boat destroyers.
ork is nearing completion on the
S. Navy aircraft carrier Enter-
se at Newport News Shipbuilding
d Dry Dock Company. She is sche-
led for delivery in May, 1938. The
S. Navy light cruiser Boise is like-
se progressing nicely, with good
spects for delivery in July of this
r. The light cruiser St. Louis is
be launched on April 15, 1938, and
delivery date is set for April of
9. Two destroyers at this yard are
be delivered in June and August
1939.
he technical staff is busy on the
paratory work for Hull No. 369,
big twin screw mail, passenger,
d cargo liner for the U. S. Lines;
d on the three large fast Standard
-Maritime Commission tankers.

Tanker H. D. Collier

(Continued from Page 28)

Radio room of the H. D. Collier, showing Mackay radio equipment.

d to straight line steaming much
ser than could be possible with
nual steering. She therefore
ams a shorter distance between
given ports and saves in ship's
e and in fuel consumption.

Wheelhouse and captain's office are connected by telephone with several points on the ship.' Henschel marine telephones are used. This maker supplied also the shaft revolution indicator.

Tanker Esso Boston ready to be launched at Federal Yard.

Orders to the engineer on watch are transmitted by Bendix Marine Products Company engine telegraphs. One of the window ports of this wheelhouse is fitted with the famous Bendix-Kent Clear Vision screen, and all the other windows have wipers of the automotive windshield type.

Walker's Patent Ship's Log Cherub No. 3 accurately records the speed of the ship.

Four Welin 30 person lifeboats swung on Welin quadrant type davits, two on the bridge and two on the poop, insure ample provision for room in boats for the entire personnel of the ship from either port or starboard side.

To insure fresh, palatable food, the H. D. Collier is equipped with three insulated chambers for refrigerated stores. One small chamber is for general utility purposes. One, of 560 cubic feet capacity, takes care of vegetables, fruits, etc. The third chamber, of 775 cubic feet capacity, is for meats. The refrigerating machinery to operate these boxes comprises two Carrier 2½ ton motor-driven units of the direct expansion type. Each of these units is a self-contained plant.

Building in American Yards

Pacific Coast

BETHLEHEM SHIPBUILDING CORPORATION, LTD.

(Union Plant)
San Francisco

NEW CONSTRUCTION: **Hull 5355—McCall (DD400).** Launched November 20, 1937; **completion date March 1, 1938. Hull 5356—Maury (DD401);** launched February 14, 1938; completion date June 1, 1938. Two 1500-ton destroyers for U. S. Navy; length, 341′ 3⅝″; beam, 35′ 6⅛″; depth, 19′ 8″. Cost $3,675,000.

DRYDOCK AND ROUTINE REPAIRS: **U.S.S. Pennsylvania, F. H. Hillman, President Cleveland, M.S. Hauraki, Capt. A. F. Lucas, St. Sch. George L. Olson, M.S. South Africa, U.S.S. Arizona, Mericos H. Whittier, Calmar, California, Monterey, Chipana.**

FELLOWS & STEWART, INC.

Wilmington, Calif.

NEW CONSTRUCTION: **Contract No. 644, 65 foot combined passenger and party boat.** Completion date May 1, 1938.

GENERAL ENGINEERING & DRY DOCK CO.

Foot of Fifth Avenue
Oakland, Calif.

DRYDOCK AND ROUTINE REPAIRS: **Gas. S. Advance, W. R. Chamberlin, Jr., Coast Shipper, Scotia, Tug Mariner, Constance Chandler, M.S. Charlie Watson, Corrales, Noyo, Barbara C, Barge S. O. Co. No. 9, Siskiyou, Solano, M.S. Balboa.**

HARBOR BOAT BUILDING CO.

Berth 264, Fish Harbor
Terminal Island, Calif.

DRYDOCK AND ROUTINE REPAIRS: **Tuna Boat Chicken of the Sea; Purse Seiners Star of Monterey, Soetrania, Sonta Rosalia.**

HONOLULU IRON WORKS

Honolulu, T. H.

DRYDOCK AND ROUTINE REPAIRS: **M.S. Olymp, Federal, President Cleveland.**

LAKE WASHINGTON SHIPYARDS

Houghton, Wash.

DRYDOCK AND ROUTINE REPAIRS: **General W. C. Gorgas, Coast Guard Atalanta, Coast and Geodetic Survey Westdahl, M.S. Expansion, Yacht Caroline.**

LOS ANGELES SHIPBUILDING & DRY DOCK CORP.

Los Angeles Harbor
San Pedro, Calif.

DRYDOCK AND ROUTINE REPAIRS: **Bark Star of Scotland, M.V. Athelknight, M.V. Athelprincess, Pat Doheny, Edwin B. De Golia, M.V. Manoeran, Golden Dragon, M.V. Marit, Sir Osborn Holmden, M.V. Silverguava.**

MARE ISLAND NAVY YARD

Mare Island, Calif.

NEW CONSTRUCTION:

Sturgeon, Submarine (SS187); keel laid October 27, 1936; **estimated launching date March 15, 1938;** estimated delivery September, 1938.

Swordfish, Submarine (SS193); keel laid October 27, 1937; estimated delivery date August 1, 1939.

Order received for construction of two harbor tugs, YT 133 and YT 134, October 7, 1937.

Order received for construction of garbage lighter (YG21), dated February 8, 1938.

DRYDOCK AND ROUTINE REPAIRS: **Cincinnati, Concord, Robin, Tern, Arctic, Melville, Hamilton, Dallas, Pike.**

THE MOORE DRY DOCK CO.

Oakland, Calif.

DRYDOCK AND ROUTINE REPAIRS: **Frances, Patterson, Georgian, Dauntless, Kewanee, Curaca, Brunswick, Redline, Elna, North Wind, W. S. Miller, Associates, Silverbelle, Columbian, Wanderer, Carolinian, Shasta, Utahan, Arizonan, El Commodore, Tug Hercules, Margaret Schafer, Alaska Standard, Oregonian, Horace Luckenbach, Sea Maid, Santa Monica, Athelcrown, San Gabriel, Alaskan, Queen Adelaide, Missourian.**

THE PUGET SOUND NAVY YARD

Bremerton, Washington

NEW CONSTRUCTION:

U.S.S. Wilson (Destroyer No. 408); standard displacement, 1500 tons; keel laid March 22, 1937.

U.S.S. Charles F. Hughes (Destroyer No. 428); standard displacement 1600 tons; order placed by Navy Department December 7, 1937.

DRYDOCK AND ROUTINE REPAIRS: **West Virginia, Astoria, Colorado, Eagle 57.**

TODD SEATTLE DRY DOCKS, INC.

Harbor Island
Seattle, Wash.

DRYDOCK AND ROUTINE REPAIRS: **President Jackson, African Reefer, Yukon, M.S. Missourian, Derblay, Tug Neptune, F. J. Luckenbach, K. I. Luckenbach, Point Palmas, Baranof, Tug Iroquois.**

WESTERN BOAT BUILDING CO., INC.

2505 East 11th Street
Tacoma, Wash.

NEW CONSTRUCTION:

Hull No. 130 Western Explorer, purse seine fishing vessel 81 x 20 x 9.5 ft.; powered by 200 H.P. Atlas 6 cylinder diesel. Keel laid October 10, 1937; launched February 1, 1938.

Hull No. 131, purse seine fishing boat, 78′ x 20′ x 9′; 200 H. P. Atlas engine; **launching date April 10, 1938.**

Hull No. 132, 50′ pick-up fishing boat for New England Fish Company. Keel laid March 12, 1938.

DRYDOCK AND ROUTINE REPAIRS: **Fishing Boats St. Anthoney, Dependable, La Touche, Western Chief, Genevieve H., Gladiator, Sitka.**

Atlantic, Lakes, Rivers

AMERICAN BRIDGE CO.

Pittsburgh, Pa.

NEW CONSTRUCTION: **10 cargo barges** 132′ x 35′ x 10′ for Campbell Transportation Co., Pittsburgh, Pa. **Delivery dates April, 1938 to September, 1938.**

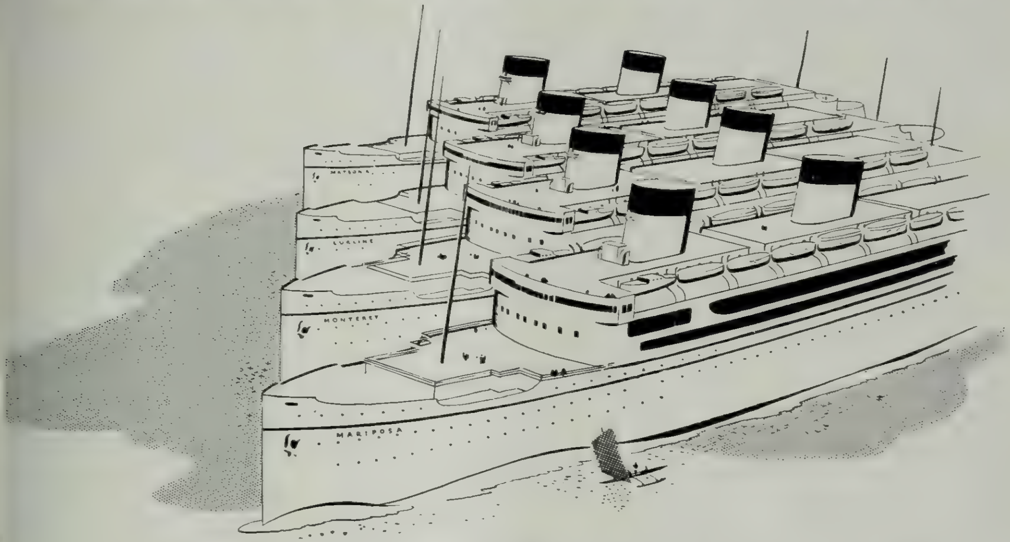
THE AMERICAN SHIP BUILDING COMPANY

Cleveland, Ohio

NEW CONSTRUCTION: **Two bulk lake freighters** 610′ x 60′ x 32′ 6″; 2,000 I.H.P. geared turbine, water tube boilers, 400 lbs. pressure, electric auxiliaries; for Pittsburgh Steamship Company. Keels laid June 21, 1937; and July 6, 1937; launching dates November 10 and December 2, 1937; **delivery date April 15, 1938.**

MATSON ENGINEERS HAVE FOUND

THE ANSWER TO STERN TUBE LUBRICATION!



Using Shell's new method of lubricating stern tube bearings, they have saved their company thousands in overhaul and replacement costs

Matson engineers were fed up with continuous damage that silt and sea water cause to stern tube bearings. Shell engineers believed they had the answer.

They got together . . . and on the basis of successful preliminary tests, Matson adopted on the S. S. Monterey Shell's new method of underwater lubrication with grease. This was in December, 1935.

When the Monterey was next dry-docked in May, 1937, the tail shafts were drawn. They were found exceptionally smooth, with no noticeable bearing wear. There was a complete absence of deep groves and cuts in the liners. The bottom half of the Lignum-Vitae bushing stayed in this time!

As a result of this almost amazing performance, Shell's underwater lubrication method was ordered for the S. S. Mariposa, S. S. Lurline and S. S. Matsonia. Today, the stern tubes of more than 140 West Coast ships are protected against sea water by this new Shell development.

A Shell marine engineer will give you full details. Phone nearest Shell office, or write: Industrial Lubricants Division, Shell Oil Company, Shell Building, San Francisco.

SHELL MARINE LUBRICANTS

BATH IRON WORKS

Bath, Maine

NEW CONSTRUCTION: Hulls Nos. 161, 162, and 163; **DD394 Sampson, DD395 Davis** and **DD396 Jouett**; Three 1850-ton destroyers for U.S. Navy; date of contract September 19, 1935. Keels laid, No. 163, March 26, 1936; No. 162, July 28, 1936; No. 161, April 8, 1936; **No. 161 launching date April 16, 1938**; others indefinite; estimated delivery dates June, August and October, 1938, respectively.

Hulls Nos. 170-171, DD409, Sims, and DD410, Hughes, two 1500-ton destroyers for U. S. Navy; contract date October 12, 1936; keels laid July 15 and September 15, 1937, respectively; launching dates, indefinite; delivery dates April, 1939, and June, 1939, respectively.

Hulls Nos. 177 and 178, DD423 and DD424, two 1620 ton destroyers for U. S. Navy. Contract date September 30, 1937; delivery dates April and June, 1940, respectively.

BETHLEHEM SHIPBUILDING CORPORATION

Fore River Plant,

Quincy, Mass.

NEW CONSTRUCTION:

CV7, Wasp, Airplane Carrier for U.S. Government; keel laid April 1, 1936; estimated delivery, November, 1938.

Hulls Nos. 1467, 1468, 1469, three passenger and freight steamers for Panama Railroad S.S. Co.; 486 feet x 64 feet x 38 feet 6 inches; 16½ knot speed. Keels laid Nos. 1467 and 1468, October 25, 1937; No. 1469, November 15, 1937.

Hulls Nos. 1470 and 1471, two 1500 ton destroyers for U. S. Government; delivery dates March, 1940 and May, 1940.

BETHLEHEM SHIPBUILDING CORPORATION

Sparrows Point Plant

Sparrows Point, Md.

NEW CONSTRUCTION: **Two oil tankers**—steam—425′x64′x34′ for Gulf Oil Corp.; total tonnage 7070 each; launching dates October 9 and December 11, 1937; **delivered.**

Four 13,000 deadweight ton steam turbine driven tankers for Standard Oil Co. of N. J.; length 442′, beam 64′, depth 34′ 10″, gross tonnage 7,600, speed 12 knots. Esso Baton Rouge launched November 13, 1937. R. W. Gallagher launched January 22, 1938.

One tanker for Texas Co.; about 13,000 deadweight tons; steam turbine.

BOSTON NAVY YARD

Boston, Mass.

NEW CONSTRUCTION:

DD402, Mayrant, and DD403, Trippe, two light destroyers for United States Navy; LPB 334′; beam 35′6″; depth 19′ 8″; keels laid April 15, 1937; estimated delivery dates August, 1939 and October, 1939, respectively.

DD415, O'Brien, and **DD416, Walke,** two destroyers; LBP 341′, beam 36′, depth 19′8″; delivery dates indefinite.

DD425, Madison, and DD426, Lansdale, two destroyers; 341′0″ x 36′0″ x 19′8″.

One harbor tug for U. S. Navy; 98′0″ LBP x 24′0″ x 13′6″; delivery date indefinite.

BROOKLYN NAVY YARD

Brooklyn, N.Y.

NEW CONSTRUCTION:

CL 48, **Honolulu,** light cruiser; L.B.P. 600′; beam 61′8″; standard displacement 10,000; geared turbine engines; express type boilers; keel laid September 10, 1935; launched August 26, 1937; estimated delivery, August 1, 1938.

CL 50, **Helena,** light cruiser; L.B.P. 600′; beam 61′7¾″; standard displacement 10,000; geared turbine engines; express type boilers; keel laid December 9, 1936; launching date January 9, 1939; estimated delivery January 2, 1940.

BB 55, **North Carolina,** battleship; L.B.P. 714′ 0″; beam to outside armor 108′ 0″; std. displ. 35,000 tons; geared turbine engines; express type boilers. Keel laid October 27, 1937; estimated launching date May 1, 1940; contract delivery August 1, 1941.

CHARLESTON, S. C., NAVY YARD

Charleston, S.C.

NEW CONSTRUCTION:

Order placed for **one harbor tug;** LOA 124′ 9″, length between perpendiculars 117′, breadth, molded, 28′, depth, molded, 16′; keel laid August 2, 1937; **launched March 7, 1938.**

Order placed for one **harbor tug;** LOA 110′ 3″; LBP 98′ 0″; breadth 24′ 0″; depth at side amidships 13′ 6″. No dates set.

Order placed for one **harbor tug;** 65 feet long.

DEFOE BOAT & MOTOR WORKS

Bay City, Mich.

NEW CONSTRUCTION:

One diesel yacht, powered by 1,000 h.p. Winton engines; 143′ long, 23′ beam; steel construction. For Cox and Stevens, New York, N.Y. Delivery date May 1, 1938.

THE DRAVO CORPORATION

Engineering Works Division

Pittsburgh, Pa., and Wilmington, Del.

NEW CONSTRUCTION:

Hulls Nos. 1435-1439; five type W-4 welded steel coal barges 175′ x 26′ x 10′8″; for stock; 2360 gross tons.

Hulls Nos. 1440-1444; five type W-4 welded steel coal barges 175′ x 26′ x 10′8″; for stock; 2360 gross tons.

Hull No. 1448; one maneuver boat hull for U. S. Engineer Office, Louisville, Ky.; 73 gross tons.

Hulls Nos. 1449-1452; four welded steel oil barges 195′x35′x9′6″ for stock; 1956 gross tons.

This makes a total of 15 hulls with a total gross tonnage of 6749 tons.

ELECTRIC BOAT CORP.

Groton, Conn.

NEW CONSTRUCTION:

Hull No. 26, Salmon, SS182, standard displacement 1450 tons; keel laid April 15, 1936; launching date June 12 1937; **delivery date March 15, 1938.**

Hull No. 27, Seal, SS183, standard displacement, 1450 tons; keel laid May 25, 1936 launched August 25, 1937; delivery date May, 1938.

Hull No. 28, Skipjack, SS184, standard displacement, 1450 tons; keel laid July 22, 1936; launching date October 23, 1937; delivery date July, 1938.

Hull No. 29, Sargo (SS188); keel laid May 12, 1937; launching date June 1, 1938; delivery date June, 1939.

Hull No. 30, Saury (SS189); keel laid June 28, 1937; launching date July 30, 1938; delivery date July, 1939

Hull No. 31, Spearfish (SS190); keel laying date September 9, 1937; launching date October 27, 1938; delivery date September, 1939.

Hull No. 33, Seadragon (SS194); 1450 tons; **keel laying date April 18, 1938;** delivery date December, 1939.

Hull No. 34, Sealion (SS195); 1450 tons; keel laying date June 15, 1938 delivery date February 1940.

THE FEDERAL SHIPBUILDING AND DRYDOCK COMPANY

Kearny, N. J.

NEW CONSTRUCTION:

Three destroyers, **DD397 Benham DD398 Ellet and DD399 Lang, estimated launching April,** June and August 1938; keels laid DD397, September 1 1936; DD398, December 3, 1936; DD 399, April 5, 1937.

One 12,800-ton tanker for the **Standard Oil Company of New Jersey;** 450′ x 66′6″ x 34′6″; Isherwood Arcform design of hull form and longitudinal hull framing; keel laid August 16 1937; **launching date March 19, 1938.**

Two destroyers, DD411 Anderson and DD412 Hammann; keels laid November 15, 1937 and January 17, 1938, respectively.

Hulls Nos. 149-150, two 12,900 ton tankers for Pan American Petroleum & Transport Co.; 440′ B.P. x 66′ 6″ x 34′ 6″, 450′ OA.; Isherwood Arcform design of hull form and longitudinal hull framing. Keels laid November 15 1937 and January 10, 1938 respectively; estimated launching dates May and July, 1938;; estimated completion date October, 1938.

Hulls Nos. 151, 152, and 153, three tankers for Standard Oil Co. of New Jersey.

JAKOBSON & PETERSON, INC.

Brooklyn, N.Y.

NEW CONSTRUCTION:

Hull No. 274, 84 foot all welded steel tug.

Hull No. 275, 70 foot auxiliary yawl

Hull No. 276, 86 foot all welded steel tug.

(Page 60, Please)

Dependable
Insurance
Since 1863

Fire · Automobile · Marine · Casualty · Fidelity · Surety

FIREMAN'S FUND GROUP
Fireman's Fund Insurance Company — Occidental Insurance Company
Home Fire & Marine Insurance Company
Fireman's Fund Indemnity Company — Occidental Indemnity Company

Strength
Permanence
Stability

New York · Chicago · SAN FRANCISCO · Boston · Atlanta

Progress of Isherwood Hull Construction System

The progress of Isherwood cons uctions has generally reflected the s te of the shipbuilding industry s ce the introduction of the Isherw od System of Longitudinal Frami in the year 1907, and thirty y rs of activity—during which per d developments have shown imp vements of great value to shipb lding — has seen that position n intained, as will be appreciated f m the following details:

During 1937 some 57 vessels, agg gating 553,000 tons deadweight c rying capacity, were ordered to b built on the Isherwood System, t "Bracketless-System", Isherwood C mbination System, and the "Arcf m Design". The fact that included i this number are 12 cargo vessels a gregating 93,000 tons deadweight s uld serve to dispel from the minds o certain people the belief that I erwood Construction is suitable o y for tankers.

The remainder of the ships are t kers of large size and a few s aller types to be built in Europe, i America and in Japan. Of the t al number, 19 vessels, aggregat i 178,000 tons deadweight, are to rcform" Design incorporating the racketless-System" and the Isherw d Combination System of Frami .

The Emile Miguet, built on the I erwood "Bracketless-System" by A liers et Chantiers de France, Dunkirk, for Compagnie Navale des Petroles, Paris, is the largest tanker ever built in France. She is fitted with two sets of four-stroke cycle Burmeister & Wain type diesel engines aggregating 7,260 B.H.P. at 121 r.p.m., built and installed by Chantiers et Ateliers de St. Nazaire, Penhoet.

The Nishin Maru No. 2, built on

Name	Dimensions	Deadweight Carrying Capacity
Emile Miguet	550′0″ x 73′ 9″ x 41′0″	21,000 tons
Nishin Maru No. 2	537′0″ x 74′ 0″ x 48′8″	21,800 "
Texas Sun	509′9″ x 65′ 7″ x 37′0″	15,800 "
Henry Dundas	490′1″ x 70′ 0″ x 37′0″	15,200 "
Esso Belgium	488′2″ x 74′ 9″ x 37′2″	15,500 "
Mobiloil	486′3″ x 68′ 3″ x 36′9″	15,515 "
Mobilgas	486′3″ x 68′ 3″ x 36′9″	15,515 "
Regina	485′1″ x 65′ 5″ x 35′4″	14,900 "
Actor	470′0" x 65′ 2″ x 35′4″	13,000 "
Realf	462′0″ x 59′ 8″ x 34′6″	12 500 "
Athos	455′0″ x 61′ 0″ x 35′0″	12,500 "
Esso Baytown	442′0″ x 65′ 0″ x 35′0″	13,000 "
W. H. Berg		
Wallace E. Pratt		
Esso Bayonne	440′0″ x 66′ 6″ x 34′6′	12,900 "
Esso Houston		
Lowther Castle	437′4″ x 57′ 1″ x 24′3″	9,250 "
Lancaster Castle	437′4″ x 57′ 1″ x 24′3″	9,250 "
Gulfcoast	426′4″ x 64′ 2″ x 34′0″	11,426 "
Gulfwave		
Gulftide		
Anglo Indian	426′0″ x 61′ 2″ x 36′6″	9,250 "
Haughton Hall	426′0″ x 56′11″ x 36′3½″	9.250 "
Iron Knight	400′0″ x 58′ 0″ x 35′6″	8.030 "
Iron Chieftain	400′0″ x 58′ 0″ x 35′6″	8 030 "
Bachaquero	365′4½″ x 64′ 0″ x 19′0″	6,800 "
Misoa	365′4½″ x 64′ 0″ x 19′0″	6,800 "

Table showing names and particulars of the larger vessels ordered in 1937 to the Isherwood system.

Marine Insurance in All Phases — "All Risks" . . . Inland Marine . . . Ocean Marine

STANDARD MARINE INSURANCE COMPANY, LIMITED
NATIONAL UNION FIRE INSURANCE COMPANY
MERCANTILE INSURANCE COMPANY OF AMERICA

GEO. E. BILLINGS CO.

Pacific Coast General Agents—Richard J. Lutich, Marine Manager

GArfield 3646
308 California St.
SAN FRANCISCO

TRinity 1521
Spreckels Bldg.
LOS ANGELES

SEneca 1478
Colman Bldg.
SEATTLE

MARINE DEPARTMENT
AETNA INSURANCE CO.
QUEEN INSURANCE CO.
MARITIME INSURANCE CO., LTD.
FIDELITY PHENIX FIRE INS. CO.
Commercial Hull Dept.
AUTOMOBILE INS. CO.

Mathews & Livingston

Marine Underwriters

200 BUSH ST. SAN FRANCISCO
Offices at: Colman Bldg. - Seattle 111 West 7th St. - Los Angeles

the Bracketless-System by the Kawasaki Dockyard Co., Ltd., Kobe, for Taiyo Hogei Kabushiki Kaisha, Tokio, is for the carriage of whale oil in bulk. This vessel is another example of the type for which the longitudinal system is particularly advantageous.

The Texas Sun, constructed on the Isherwood Bracketless System by the Sun Shipbuilding Company, Chester, Pa., is one of the largest tankers built in recent years. The propelling machinery consists of a six cylinder Doxford type engine built by the Sun Company, which has a rating of 5,600 B.H.P. at 100 r.p.m., the cylinders having a diameter of 25.2 inches, and a combined stroke of 79.1 inches.

The Esso Bayonne and Esso Houston are two of four of the same design built and ordered to be built by the Federal Shipbuilding & Dry Dock Company, Kearny, N. J., for the Standard Oil fleet. These vessels, which are to be operated by the Standard Oil Company of New Jersey and which are constructed on the Isherwood "Bracketless-System" and to the "Arcform Design", showed remarkable results on trial and came up to the expectations of the builders and owners. They are fitted with steam turbine machinery.

The Gulfcoast, Gulftide and Gulfwave are three more interesting tankers completed by the Bethlehem Shipbuilding Company, Sparrow's Point, Maryland, for the Gulf Oil Corporation, New York. Built on the Isherwood "Bracketless-System" and to the "Arcform Design", they have proved to be successful additions to the already large fleet of Isherwood ships owned by the Gulf Oil Corporation, who for many years past have ordered all their ships to be built to Isherwood constructions. It is interesting to note here that two more of the same type and size are at present under construction by the same builders for the same owners.

The Haughton Hall, built on the Isherwood Combination System by James Laing & Sons, Ltd., Sunderland, for Chas. G. Dunn & Co., Ltd., Liverpool, is a very fine vessel for the carriage of grain in bulk. The propelling machinery, by Richardsons, Westgarth & Co., Ltd., West Hartlepool, consists of triple expansion direct acting engines capable of developing 2,100 I.H.P., steam supplied being from three large Multitubular boilers with forced draft and superheated — working at 229 lbs. per sq. in. exclusively on oil fuel.

The Iron Knight and Iron Chieftain are of a type that calls particularly for special strength of hull, which invariably leads to the adoption of Isherwood construction. Built on the Isherwood Combination System of Framing for the carriage of iron ore by Lithgows, Ltd., Port Glasgow, for the Broken Hill Proprietary Co., Ltd., of Australia, they are of the shelter deck type with machiner aft and cruiser stern. The propellin machinery, by David Rowan & Co Ltd., Glasgow, consists of quadrupl expansion engines combined wit Rowan-Gotaverken turbo-compresso and Babcock & Wilcox watertub boilers. These vessels are practicall duplicates of two similar ships com pleted in 1936, and all four wer built to plans prepared or approve by Sir Joseph W. Isherwood & Co Ltd., who designed the vessels in co laboration with the owners.

The Anglo-Indian, described as th last word in cargo ships, is built o the Isherwood Combination System c Framing and to the "Arcform Design of hull by Short Bros., Ltd., Sunde land, to the order of Sir John Latt Bt., and is perhaps one of the be present-day examples of economi construction in this type of ship. I addition to the economy gained b the adoption of the Isherwood desig of hull, the Reheater engine supplie by the North Eastern Marine Engi eering Co., Ltd., gives further eco omy in consumption.

All types and sizes of vessels a included in the very large fleet ships constructed on the Isherwo principle (unquestionably the la est fleet of its kind in the world).

There are now over 2,500 vessel aggregating in deadweight carryi capacity some 20½ million tons, bu and building to Isherwood Constru tions.

Running Lights of Pacific Shipping

CHARLES H. ROBERTSON, assistant manager, Marine Department, Standard Oil Company of California (he's "first" to Chief Joseph McEachern). With Standard for 23 years . . . including those grand days when Robert (Bob) L. Hague was a "Coast Defender." Has watched the constant development of the S.O. of Cal. fleet recently climaxed by construction of distinctive tankers W. H. Berg and H. D. Collier. President of Propeller Club of Cal. 1935. Married and a resident of Mountain View. Fellows like to work with him . . . and for him. His leadership inspires!

FRED M. ROHRER makes P.M.R.'s spotlight this month . . . just appointed Assistant to Executive Vice-President Daulton Mann . . . goes to New York from San Francisco. Joined Pacific Mail when 15 years old. Served under such "stalwarts" of the old shipping school as R. P. Schwerin, A. J. Frey, Bill Chisholm. Navy man during World War. No stranger to East Coast, he has had several years New York service. His Pacific friends will miss him . . . and wish him grand success!

W. EDGAR MARTIN, the Westinghouse marine department he in San Francisco. Born in Brooklyn. Has always worked for We inghouse . . . always in marine department . . . the company ra ed him in engineering—heavy technical subjects at the U. of Co rado. (Graduate student course.) To the Coast with first turbin jobs many years ago. Lives down Peninsula. Married and a la hter Phyllis, who is a Stanford co-ed. Plays a sweet fiddle. o when time permits. Main hobby: Visiting new engine room ob in his constant study of marine propulsion developments. He s ddie" to thousands of Coast maritimers!

ALBERT O. PEGG, superintending engineer of Union Oil Company. Headquarters in the L.A. Building, where he works closely with Wm. Groundwater, chief of Transportation of the big U.O. tankship fleet. Bert Pegg has scores of friends in S.F. ship circles. Active member A.S.M.E. . . . also Society of N.A. and M.E. At present supervising construction of firm's new tanker at Bethlehem yard. Lives at Wilmington.

Propeller Club of California News of the Month

● Luncheon Meetings.

On March 15th a capacity attendance watched with absorbed interest the projection of a Round the World Movie, the photography of **David Dorward, Sr.,** one of our own members. The scenes brought his audience to Bali, Singapore, and Continental Europe. Grand pictures!

Chairman of the day was **James H. Young** . . . and a good job of gavel-pounding he did.

The March 29th luncheon was also a bell-ringer! **Henry A. Dietz** of the U.S. Attorney's office in California and formerly a special agent in the F.B.I. gave us "Experiences of a G-Man." Thomas A. Short was "skipper of the day," and got a big hand for his forensic introduction and the "sign-off." Nice work, Tom!

Speaker Dietz proved a fluent talker who knows as much about holding an audience as he does about rounding up criminals. He explained the various functions of the Bureau —the jurisdictional scope and the elaborate training which the men receive before they are full-fledged operatives. We came away with a tremendous respect for this law-enforcement branch of the Government and the club was indeed fortunate in having Mr. Dietz appear before its membership.

N.Y. Guest.

Berry E. Dunn introduced his guest, **Joseph E. Garabrand,** vice-president of Kearfott Engineering Corp. of New York, at the March 29th meeting. Mr. Garabrand was enthusiastic in his praise of the lively turn-out.

● New Committees.

The important post of chairman of the Membership Committee has been assigned to **Phil H. Harding,** who will have as his associates:

Jack Bond
Ed Harms
George Swett.

Kenneth Ingraham has been named chairman of the Schoolship Committee, and is laying plans for speakers, programs, and visits aboard the California State upon her return to her home port. These speakers will be selected from our own memberships . . . men versed in technical and operating branches of the Marine subject. Chairman Ingraham's committeemen are:

Capt. Cy Meek
Gene Winter.

San Francisco Marine Exchange

Complete arrangements have been made for the formation of the new Merchants Exchange, and the marine department of the San Francisco Chamber of Commerce has moved back to its former quarters in the Merchants Exchange Building. The official name of the group is the Marine Exchange of the Chamber of Commerce, and it promises to become a vital unit in the fight to put the port back into its place in marine affairs.

Officers of the new Marine Exchange are: Harry S. Scott of the General Steamship Corporation, president; E. H. Harms of McCormick, Hugh Gallagher of Matson, George A. Armes of General Engineering & Dry Dock, all vice-presidents; Lewis Lapham of American Hawaiian, secretary. Election of a treasurer and announcement of the board of directors will be business of the next meeting.

A membership drive for the new organization is being conducted by Frank O'Connor, official of the Shipowners' Association.

GEORG VON ERPECOM

A recent visitor to San Francisco was Georg Von Erpecom, managing director of the firm of Westfal-Larsen, who is on a business trip. While here, he visited the agents handling his two services—the South American service, represented by the General Steamship Corporation, and th European service, represented by th Interocean Steamship Corporation.

AT "CASA DE LA PAULSEN"

Our fotoman here caught (L to R) W. R Richardson, general sales manager of B. F Goodrich Co., Monroe Paulsen, president o Hercules Equipment & Rubber Co., an J. H. Connors, vice-president of the Goodrich organization, enjoying California sunshine at the Casa de la Paulsen. The wide awake Hercules firm is Northern Californi distributor for Goodrich mechanical rubber goods.

CAPTAIN WILLIAM FISHER

The Masters, Mates and Pilot Local 90 have endorsed Captain William Fisher, supervising inspector o the Bureau of Marine Inspection an Navigation, for appointment to th Maritime Commission. Captain C. F May, president of the union, announced that the action was take by meetings in all ports on the Coast and the union will ask the Maritim Federation and all individual union to approve the endorsement.

GOLDEN GATE INTERNATIONAL EXPOSITION
1939
on San Francisco Bay
TREASURE ISLAND

903 FIFE BLDG.
1 DRUMM ST.

THOMAS A. SHORT

Successor to

C. V. LANE

Marine Representative:
Thos. A. Short,
1 Drumm Street, San Francisco

HYDE STEERING GEARS
HYDE WINCHES
HYDE WINDLASSES
HYDE CAPSTANS
HYDE MANGANESE BRONZE PROPELLERS & CASTINGS
A. B. SANDS & SON CO., PLUMBING FIXTURES
SMOLENSKY NOISELESS CHECK VALVES

BACHARACH INDUSTRIAL INSTRUMENT COMPANY
DIEHL MFG. CO. FANS, MOTORS, GENERATORS
SUBMARINE SIGNAL COMPANY FATHOMETER
COLORED CRAYONS
METAL WORKERS' CRAYONS
WELIN QUADRANT AND SHEATH SCREW DAVITS
MACLACHLAN GRAVITY DAVITS

LIFEBOAT WINCHES
METALLIC LIFEBOATS AND LIFERAFTS
SHORT OIL SEPARATOR
WILLIAM W. NUGENT & CO., OIL FILTERS
U. S. METALLIC PACKING
CONSOL RUST REMOVER
CONSOL RED and BLACK
HASKELITE—PHEMALOID
PLYMETL ORNAMENTAL PANELS

B. F. GOODRICH CUTLESS RUBBER BEARINGS

MEEHANITE CASTINGS—PISTON RING STOCK, BURNER CONES, ETC. R. P. ADAMS POROUS FILTERS

SHORT OIL DETECTING SERVICE FOR PROTECTING BOILER FEED WATER AND FUEL OIL HEATERS

Hyde Windlass Company

Steering Gears, Windlasses, Capstans, Bronze Propellers —as installed on America's finest ships.

Bath, Maine

Pacific Coast Representative:
Thos. A. Short, 1 Drumm Street, San Francisco

Inter-Coastal Paint Corporation

SAN LEANDRO, CALIFORNIA

Originators and sole manufacturers of CONSOL both plain and in colors. A conditioning solution for metal surfaces that have become corroded. Not only a scale remover but a preservative as well. Gives excellent results when applied to boottop belt, hull, holds, bilges, tank tops, chain lockers, ventilator trunks, decks and so forth. Is non-inflammable and contains no acids or chemicals that are injurious to men or metal.

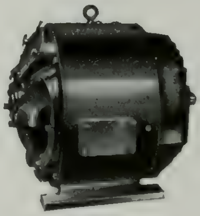
Marine Representative
Thos. A. Short, 1 Drumm Street, San Francisco

Marine Motors, Generators and Ventilating Equipment

DIEHL MANUFACTURING COMPANY

Electrical Division of
THE SINGER MANUFACTURING CO.
Elizabethport, New Jersey

San Francisco Representatives:
MARINE ELECTRIC CO. Desk and Wall Fans
THOMAS A. SHORT Motors, Generators, etc.



BERRY E. DUNN

Representing . . .

KEARFOTT ENGINEERING CO., Inc.
Kearfott Windows

LOCKWOOD-CARLISLE
Piston Rings Carried in Stock

420 MARKET STREET SAN FRANCISCO

Contributing to your overhead economies!

PLYMOUTH ROPE . . . offers longer life and greater dependability in hard service because of its unsurpassable QUALITY

PLYMOUTH CORDAGE COMPANY
NORTH PLYMOUTH • MASS

Maritime Commissioners

● **Rear Admiral Emory Scott Land, U. S. Navy (Retired)**

The new Chairman of the U. S. Maritime Commission, Rear Admiral Emory S. Land, U. S. N., (retired), was born in Canon City, Colorado, January 9, 1879, and was appointed to the Naval Academy from Wyoming in September, 1898.

After receiving his commission as Ensign, U. S. Navy, he completed the postgraduate course in naval architecture at the Massachusetts Institute of Technology. In 1904 he was appointed Assistant Naval Constructor with the rank of Lieutenant (junior grade); was commissioned Naval Constructor with the rank of Lieutenant in 1912; promoted to Lieutenant Commander, Construction Corps, August 29, 1916; to Commander, Construction Corps, January 1, 1921; and Captain in 1923.

During the World War he was on duty in the Bureau of Construction and Repair, Navy Department, and was awarded the Navy Cross with the citation:

"For distinguished service in the line of his profession in connection with the design and construction of submarines and for work in the War Zone."

In 1919 Rear Admiral Land served with the Allied Naval Armistice Commission, and in 1920 was appointed Assistant Naval Attache at the American Embassy, London, England.

Returning to the Navy Department in 1921 Rear Admiral Land was on duty in the Bureau of Construction and Repair, was later transferred to the Bureau of Aeronautics and was qualified as a Naval Aviation Observer. He was appointed a member of the Army and Navy Helium Board in April, 1923, and in November of that year was appointed a member of the Postgraduate Council, Naval Academy, Annapolis, Maryland.

On August 16, 1926, he was appointed Assistant Chief of the Bureau of Aeronautics and served in that capacity until September, 1928, when he was granted leave for duty in connection with the Daniel Guggenheim Fund for the Promotion of Aeronautics, where he was appointed vice president and treasurer. At this time he qualified for a pilot's license from the Department of Commerce.

From March to September, 1930, he was on duty as Aide on the Staff, with additional duty as Fleet Constructor, U. S. Fleet. In October, 1930, he reported for duty in the Office of Naval Operations, Navy Department. In October, 1932, he was assigned to duty as Acting Chief Constructor of the Navy and Chief of the Bureau of Construction and Repair and received his appointment as Chief Constructor of the Navy and Chief of the Bureau of Construction and Repair for a period of four years on March 15, 1933.

Admiral Land has received the Spanish Campaign Badge, the decoration of Honorary Commander of the Military Order of the British Empire (1922), and a special letter of commendation by the Chairman of the National Advisory Committee for Aeronautics (1929).

● **Max O'Rell Truitt**

The new member of the U. S. Maritime Commission is a resident of St. Louis, Missouri, where he formerly practiced law. He came to the Maritime Commission as General Counsel in April, 1937, when Joseph P. Kennedy became its Chairman. As General Counsel Mr. Truitt supervised the settlement of the ocean-mail contracts, involving the release of approximately $70,000,000 in claims against the Government by the steamship lines. The docket of pending legal cases inherited by the Maritime Commission from its predecessors was very large at the time Mr. Truitt took office. By the end of 1937, he had reduced the number of these cases 56.8 per cent, involving approximately $15,000,000 of claims. In addition, he has supervised the preparation of the extensive amendments to the Merchant Marine Act, 1936, now under consideration by Congress.

Prior to his connection with the United States Maritime Commission, Mr. Truitt had been Special Counsel to the Reconstruction Finance Corporation, handling railroad reorganization cases, and was trial counsel for the Government in United States vs. Bankers Trust Co., the case involving the constitutionality of the Gold Clause of the Banking Act of 1933. In April 1935 he accepted the position of Solicitor to the Reconstruction Finance Corporation and was transferred to Washington, where he handled litigation for the Corporation.

V. H. Kelly, director of sales, Union Oil Company, who has been elevated to the company's board of directors after long and distinguished service in the company's marketing operations.

● **Named Union Oil V.P.**

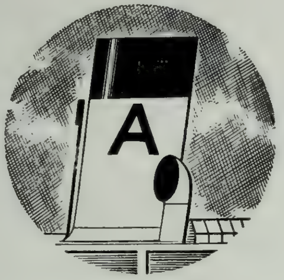
A. C. Galbraith, identified with Union Oil Company for the past 22 years, was elected a vice-president of the company at the organization meeting of the Board of Directors following the annual meeting on March 1, 1938.

Galbraith started with the company as traveling auditor in the comptroller's department, and since that time has had a wide experience in various phases of company activity. In 1923 he was appointed manager of advertising, and in 1931 became assistant vice-president. During the past few years he has been in charge of Industrial Relations and Personnel, and in his new capacity will continue to direct this important work.

The heads of three operating departments of the company were elevated to Union's board of directors at the last stockholders meeting. The three new directors are: **V. H. Kelly,** director of sales; **R. E. Haylett,** director of manufacturing; **A. C. Rubel,** director of production. The new directors also were made members of Union's executive committee, which was increased from six to nine members so as to include the operating heads in all councils.

Called to the company's head office in Los Angeles in 1929 to serve as chairman of the sales committee, after 16 years service in the Northwest, Mr. Kelly successfully became manager of domestic distribution and, in 1931, director of sales.

AN ASSOCIATED PRODUCT FOR EVERY MARINE NEED



★ ★ ★

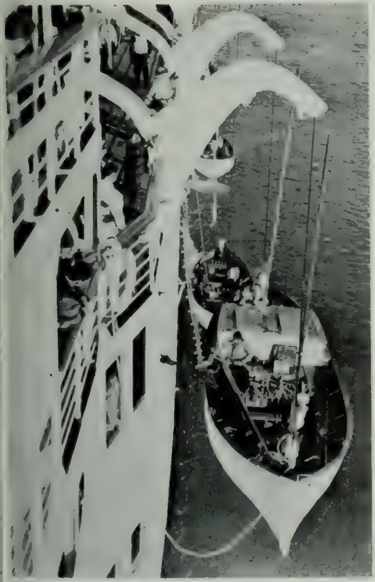
For over seventeen years Associated has served the marine trade of the West Coast—constantly developing old products and adding new. Today, every marine Petroleum need is supplied in this list of quality Associated Marine Products.

ASSOCIATED BUNKER FUEL OILS
ASSOCIATED BUNKER DIESEL OILS
AVON MARINE ENGINE OILS
CYCOL TURBINE OILS
CYCOL MARINE DIESEL ENGINE OILS
AVON STEAM CYLINDER OILS
AVON MARINE AUXILIARY ENGINE OILS
A FULL LINE OF MARINE GREASES

ASSOCIATED DIVISION
TIDE WATER ASSOCIATED
OIL COMPANY

LISTEN TO THE ASSOCIATED TRACK SPORTCASTS

. S. *Matsonia* Equipped by WELIN



With the Most Modern
Life-Saving Equipment

— 7 TIME-TESTED FEATURES —

1. One man control.
2. Lifeboat launched in 1 minute.
3. Single wire rope falls reeved on common winch.
4. More usable deck space.
5. Lifeboat always lowered on even keel.
6. Gravity winch and electric hoisting motors built integrally with davits.
7. Rugged and foolproof.

View showing the Welin-Maclachlan Gravity Davits in operation, lowering Welin Cabin Motorboats.

Welin Davit & Boat Corporation
8 Lister Avenue, Newark, N. J.

AGENT: THOS. A. SHORT, 1 DRUMM ST.,SAN FRANCISCO, CALIF. SUtter 7622.

Names and News

● Dr. Arthur A. O'Neill

News has come to us of the death of Dr. Arthur A. O'Neill, past veteran surgeon on the Pacific Mail ships. He was graduated from Cooper College of Medicine, and for the past 15 years was professor of medicine at Stanford Medical School, for many years being also connected with the San Francisco Health Department. Mayor Taylor asked for Dr. O'Neill's services in organizing an isolation hospital for the care of communicable diseases, in which capacity he also served under Mayors McCarthy and Rolph, the latter asking him to act as city physician, where he remained until his passing.

Dr. O'Neill was one of the three remaining survivors of the Rio de Janeiro catastrophe in 1911.

He was a past president and past secretary of the San Francisco County Medical Society and was a member of the Commonwealth Club, the Elks Club, the Propeller Club, the Knights of Columbus and the Academy of Medicine. He was also an honorary consultant of the United States Public Health Service.

He is survived by his widow, Stella Montague O'Neill.

● A. H. Bryant: David C. Young.

It is with regret that we note the death of two prominent marine surveyors of the Pacific Coast—A. H. Bryant, chief surveyor for the Board of Marine Underwriters in Portland, and David C. Young, long chief surveyor for the Board at San Francisco and surveyor for the United States Salvage Association.

Mr. Young's experience and ability established his reputation in the profession—a reputation unsurpassed in the history of Pacific Coast maritime affairs. He came from the sea, with chief engineer's papers, to the post of supervising engineer for the old Hanlon shipbuilding plant in Oakland. Several years later, thoroughly familiar with shipbuilding problems, he was selected as Northwest manager for the Bureau of Survey at Seattle, and in 1921 was appointed chief surveyor for the Pacific Coast for the United Salvage Association. During the following years he combined the duties of that post with those of his position as chief surveyor for the Board of Marine Underwriters at San Francisco.

The late Dr. Arthur O'Neill (front left) shown with officers of the ill-fated Rio de Janeiro.

● Mackay Marine Dept. Moves

The Marine Department of Macka Radio and Telegraph Company ha moved from its former quarters at 3 South William Street to the Thir Floor of the International Telephon Building at 67 Broad Street in whic other headquarters offices of Mackay Radio in New York are situated According to H. L. Rodman, Genera Manager of Mackay Radio's Atlanti Division, this move to larger spac has been necessitated by Macka Radio's rapidly expanding activity i the marine field on the East Coas under its new Marine Superintendent, W. V. Russ.

● Transmarine Navigation Corp.

The Transmarine Navigation Co poration of Los Angeles recently appointed United States agents for th Salen Line, have established an office at 244 California Street, Sa Francisco; with Robert G. Kende as San Francisco district manage Kendell has been associated with th steamship business for many year having been connected with State Steamship Company in the Orien since 1929. He was assistant manager of that line in Manila for fou and a half years, and in 1933 wa promoted manager of the Shangha office. When the States Line close their Shanghai offices in 1937 he r turned to the Pacific Coast, arrivin in October, and recently became associated with the Transmarine Nav gation Corp.

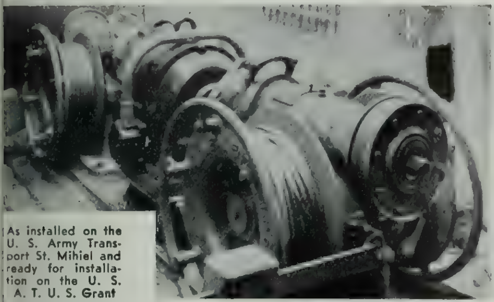
Head offices of the new Californi corporation are located at 1018 Commercial Exchange Building in L Angeles, with Max Linder as pres dent and general manager, assist by W. F. Moore, the latter former chief clerk and acting general age for Dollar Line.

● Buda Appoints Vice President

R. K. Mangan has been appoint Vice President of The Buda Co pany in Charge of Advertising, D mestic and Export Sales of Dies and Gasoline Engines sold to t Marine, Automotive, General Indu trial, Stationary and Oil Field trad Mr. Mangan has been associated wi The Buda Company in an enginee ing and sales capacity for approx mately twenty years.

THE Genco POWER AND HAND WINCH

. . . for launching life boats aboard your ships *will more than meet requirements*



As installed on the U. S. Army Transport St. Mihiel and ready for installation on the U. S. A. T. U. S. Grant

GENCO WINCHES have been subjected to vigorous tests from which they have triumphed over all lifting and lowering requirements . . . WITH A SUBSTANTIAL EXTRA FACTOR OF SAFETY.

GENERAL ENGINEERING & DRY DOCK CO.

0 Sansome Street, San Francisco — Foot of 5th Avenue, Oakland — Foot of Schiller St., Alameda

tern, Great Lakes and Gulf Ship Operators are invited to communicate with C. C. Galbraith and Sons, Inc., 99 Park Place, New York

---

Reduce Operating Costs

Application of HUNT-SPILLER Air Furnace GUN IRON Wearing Parts in the cylinders of your Diesel or steam reciprocating engines offers big savings in operating costs.

Their resistance to high temperatures and frictional wear insures long service life between renewals and retruings; also economical fuel consumption, maximum efficiency and higher availability of the vessel.

Records of hundreds of installations in all classes of service prove the superiority and economy of HUNT-SPILLER Air Furnace GUN IRON. Complete applications which include Liners, Pistons and Packing Rings insure maximum savings.

HUNT-SPILLER MFG. CORPORATION

383 Dorchester Ave. — South Boston, Mass.

V. W. ELLET
Pres. & Gen. Mgr.
383 Dorchester Ave.

E. J. FULLER
Vice President
South Boston, Mass.

Thos. G. Baird
16 California Street
KE-1142
San Francisco

HUNT-SPILLER *Air Furnace* GUN IRON

Pacific American Merchant Marine

(Continued from Page 17)

Congress is asked to equalize this differential by granting subsidies of various types. There are two very simple methods of determining the relative costs of building in foreign yards and the foreign wage scale: By submitting the plans of the proposed vessels to the Maritime Board the cost of duplication in foreign shipyards is readily ascertainable, and the Government is asked to make up this difference to the prospective ship operator.

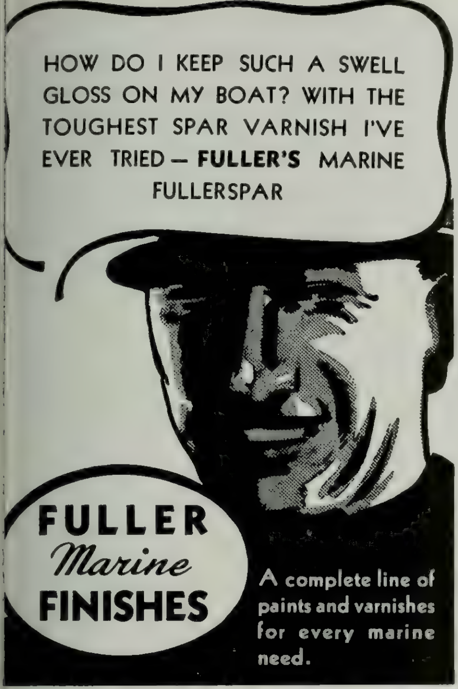
To secure cargoes moving in both directions means an entire revamping of the historic background of this nation as it relates to international trade. Take the American export trade of the Pacific Coast for example. Australia, New Zealand, South Africa, South America and United Kingdom offer the best and largest markets for American lumber, but in every instance these countries, with the exception of Great Britain, are producers of primary products and directly competitive in the markets of the world with American primary products. In order to secure the funds with which to purchase American lumber or other goods these primary products must be exchanged. Consider Argentina: This country should be a large purchaser of American lumber. Argentina is producer of such primary products as corn, wheat and other cereals. She also exports fresh and canned meats. Any effort to increase the sale of Argentine products in this country at once arouses the concerted opposition of the American producers, which is reflected in higher tariffs, thereby decreasing opportunities for expanding trade in American lumber or manufactured products in Argentina. The same situation applies to the British dominions, which can provide an enlarged outlet for American lumber.

The American lumber industry of the Pacific Coast has felt the full force of retaliatory high tariffs in countries which formerly consumed large quantities of lumber, such as Australia. Here again the high tariffs on wool and other primary products such as butter and meat has caused the Australian door to be shut in our faces. An attempt is being made through reciprocal agreements to bring about a wider exchange of commodities produced in the United States with Canada, Australia and the United Kingdom. Reciprocal trade agreements have been made with sixteen countries with an increased volume of trade as the result of such agreements. There is no other plan which can be devised to open the doors of these countries to American lumber except through trade agreements.

Now, how much study has been given by the leaders of the lumber industry of the Pacific West in helping formulate governmental policies by creating sentiment which would provide a wider market for the products of those countries in which American lumber producers hope to sell their goods? The recovery of the markets hitherto open to American lumber exporters will require the exercise of the highest type of sales statesmanship. Passing resolutions and besieging Congress will not avail. Foreign trade is essentially reciprocal in its nature, and if the closed markets to Pacific Coast exporters are to be regained it can only be done through reciprocal trade agreements, in which the lumber industry must lead.

The problem of securing a satisfactory solution of the labor problem affecting ships operating in the foreign trade and equalizing the foreign wage scale is not an easy task. The suggestion is offered for discussion: Let the Treasury Depa
ment ascertian every six months t
prevailing rate of wages by t
world's principal countries in co
petition with the American lin
Upon certification, the Americ
ship operator would document a l
of the crew and deposit the amou
of wages based on the foreign wa
scale, as predetermined by the Trea
ury Department, which in turn wou
pay the crew at the custom hous
or other designated depositor
throughout the world the differen
between the foreign and Americ
wage scale. By this plan the Ame
can seaman could visualize that
was receiving his part of the subsi
and remove any real or fancied gri
ance regarding the question of wa
differentials.

Having attempted to place t
American operator on an even ke
with his foreign competitor, and t
crew on a satisfactory wage bas
encouraged reciprocal trade agr
ments with foreign nations in orc
to insure return cargoes, let us s
what may be done towards the c
tivation of the good neighbor id
between countries, more especia
Canada, which is the formidal
competitor in foreign markets w
Pacific Coast lumber. American t
iffs curtailed her exports to t
United States. Under the recip
cal trade agreement between the t
countries, Canada was permitted
annual quota of 250,000,000 boa
feet of Douglas fir (Oregon pi
and western hemlock, to enter
United States at a $2 duty per th
sand board feet. During the calen
year 1937 imports of these woods t
aled 139,902,268 board feet. Dur
this period Canada purchased
proximately $500,000,000 of Ameri
products. In 1929, before the en
ment of the Smoot-Hawley tar
Canada imported nearly one bill
dollars of American goods and
United States imported during
same period, approximately $500,0
000 of Canadian raw products.
is the second largest purchaser
American manufactured products
would seem, if there was ever a t
when the United States needed
cultivate friendly relations and st
ulate foreign trade to take up
slack of unemployment with milli
of idle men to be fed, it is the p
ent.


HOW DO I KEEP SUCH A SWELL GLOSS ON MY BOAT? WITH THE TOUGHEST SPAR VARNISH I'VE EVER TRIED — FULLER'S MARINE FULLERSPAR
FULLER *Marine* FINISHES
A complete line of paints and varnishes for every marine need.

THE FINEST FINISH

that ever put to sea!

You'll give *your* ship greater beauty and greater protection with Du Pont DULUX. The proof of this lies in the simple fact that DULUX is the standard finish on thousands of craft of every kind today. DULUX can "take it." It resists salt air, salt spray, discoloring harbor gases, mechanical injury. It saves money because it requires fewer repaintings. For details, write to or telephone DU PONT, 601 Third St., San Francisco. 2419 South Grand Ave., Los Angeles. 525 Boren Ave., N., Seattle.

DU PONT DULUX
REG. U. S. PAT. OFF.
MARINE FINISHES

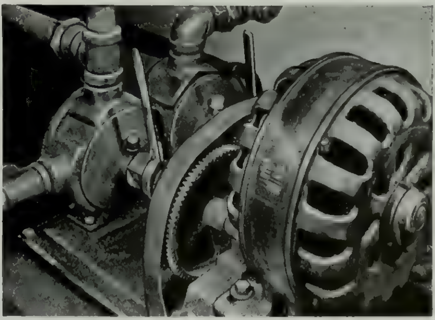
CHAPTER IV ON AMERICAN COMMERCE

LUMBER

bove: Logging by tractor in the virgin forests of western Washington.

arly American settlers built shelters and stockades with logs. However, eing considered otherwise useless, forests presented the first great bstacle to westward migration. Thus through necessity lumbering became e first industry in the United States.
he first sawmill opened in 1625 at Jamestown, Va., operated by water ower, and produced only a few hundred feet of lumber daily. Timbers ere hewn, shingles split, and boards sawed by hand.
ow, using steam and electricity, the United States is the largest lumbe roducing country, cutting about forty billion board feet annually and applying over one-half the world's lumber. The Pacific Northwest and alifornia produce about 45 per cent of the total, the South 40 per cent. his country consumes over 60 per cent of its annual production fo nstruction, and exports approximately $160,000,000 yearly. In the ture, to halt depletion of supply, lumber will come from forests grown under scientific management.
he McCORMICK STEAMSHIP COMPANY transports a huge share this lumber Pacific Coastwise and to the East Coasts of North and outh America. We are specially equipped to handle your products too, gardless of type or size, with care and dispatch.

McCORMICK STEAMSHIP COMPANY
461 Market St., San Francisco
DO 2561



PUMPING, PUMPING, PUMPING!

On the job for 23 years and still going strong. This Viking Twin Unit, now owned and operated by the Marshall-Wells Company of Minneapolis, is a typical example of Viking performance and stamina. But topping this amazing service record is the fact that not one cent for repairs has been spent on this pumping unit in the last 10 years. Isn't this the kind of service you've been looking for?

PACIFIC COAST DISTRIBUTORS:
2038 S. Santa Fe Avenue
Los Angeles, Calif.
De Laval Pacific Co.
61 Beale St.
San Francisco, Calif.

VIKING PUMP CO.
CEDAR FALLS, IOWA.

Hongkong to San Francisco in the Fifties

A San Francisco Bay schooner of the type described in this article.

(Continued from Page 31)

At times there were many floating tree stumps in the river; they generally float under the surface of the river and often when coming about you would foul such a log and have much trouble to get clear again; these logs are called "snakes" and many times when the centerboard hits one in deep water, the centerboard will suddenly fly up in the air.

One day as we were tacking up the river and everything was quiet and serene, I sat on top of the centerboard box peacefully smoking my pipe, when all of a sudden I and my pipe went sailing through the air and landed with a thump on the deck; the centerboard had hit a snag. Take my word for it, I never sat on the centerboard box after that.

One day we tied up to the bank near a farm to load wheat. A plank reached from the bank of the river to the deck of our ship and across this plank we had to wheel the sacked wheat. None of us had had any experience along this line and consequently once in a while we would run off the plank and down into the water would go man, wheelbarrow and wheat, all in a heap. The farmer, of course, objected to his wheat getting wet—but didn't mind what happened to us or our barrows. However, there was nothing he could do about it and before long we became expert in wheeling the barrow safely over the plank.

The scow I was on belonged to an Italian, de Freeze, by name, who was a very good boss to sail for, but after a while I became tired of the river and quit, to go sailing on coasting schooners.

This life was very hard and uncertain and many times I ran out of money and slept on the soft side of a pine plank down on the lumber wharves, consequently I began to consider the advisability of getting back to Europe again. I was offered a second mate's job on a bark bound for the South Sea Islands to load guano for Antwerp and had decided to take the job. I wrote to my Father, and Larssen's in Antwerp that I was coming home and started for the post-office to mail my letters. I never reached there, however, for on the way I met a man who told me that if I wanted a chance to sail with him, all I had to do was to go down to the Jackson Street wharf and hop on the "Julius Pringle" which was lying there ready for sea.

I had been out of work for a long time and was sorely in need of a bunk and a decent meal, so I promptly thanked the man and started for the ship. On the way it occurred to me that I had not inquired what my job was to be or what pay I was to receive, nevertheless I was glad to take the job, though I didn't know just why.

When I got down to the schooner I asked for the skipper but was informed he was up looking for a mate, so I concluded the skipper must be the man who had hired me and asked if all hands were onboard and on being told that they were, knew, of course, that I was to be mate, so I jumped onboard and said:—"I'm the boy the Old Man was looking for and he'll be down directly, so jump to it boys and get the mainsail up." Just then the Captain, Robert Sudden, arrived and we let go the lines, set the sails and went to sea.

When we got outside the skipper told me we were to load farm products off Pajaro, Monterey Bay, and that my wages, to begin with, would be $60. per month. With the exception of a trip to Puget Sound as skipper of a small brig, "Flying Dart," and a trip on the coast with one of Wending's schooners, I sailed in Sudden's schooners from that time unt I secured a ship of my own.

Though this was far from an eas trade to be in, I came to rather lik it. We loaded on an open coast whe there were generally heavy breake on the beach. Outside these was a chored a large buoy from which tw steel wires were connected to shor as well as an endless manila hawse reaved through a block on the bu and operated by a capstan ashor The capstan was, in turn, operate by a horse and the two steel hawse were used to lead a boat backwar and forward, between the buoy an the shore, the boat being, of cours hauled in both directions by the ma ila "running" rope.

We loaded mostly wheat and bea which were sacked and loaded int the boats. Two men accompanie each boat to keep it between th wires and as soon as the boat wa loaded, it was secured to the manil runner and the horse, by going roun and round the capstan, pulled it o to the buoy. We would be waiti at the buoy with a surf-boat a take on the cargo, bring it out the schooner and while the surf-bo was being discharged, the empt shore-boat would be hauled in a a full one brought out again.

It was hard work, I can tell yo especially when the weather was little rough, for as the shore bo was loaded on a sandy beach t sacks would be covered with w sand, and this would cut our finge till the blood spurted out of t finger tips; this was always the ca for the first few trips, till the sk on the finger tips would beco toughened and be almost as ha as if covered with bone. Many tim we were compelled by bad weath to up anchor and seek shelter behi Point Pinos.

PLANT

PLANT RUBBER & ASBESTOS WORKS

SALES OFFICES
SAN FRANCISCO LOS ANGELES
OAKLAND WILMINGTON

FACTORIES
SAN FRANCISCO LOS ANGELES
REDWOOD CITY

ASBESTOS SUPPLY COMPANY
DISTRIBUTORS AND APPLYING CONTRACTORS
PORTLAND SEATTLE TACOMA SPOKANE

Mo-Lo

The Perfect Piston Iron
No Blow Holes, No Waste and Machines Easily.
294 Sizes in Stock.
Ask for our stock list.

TRADE **LESLIE** MARK

PRESSURE REDUCING VALVES
PUMP GOVERNORS
TEMPERATURE REGULATORS
SELF CLEANING STRAINERS

TRADE **TYFON** MARK
WHISTLES
SIGNALS

LESLIE CO., FOUNDERS AND MANUFACTURERS
LYNDHURST, N. J.
John H. Marvin, 1016 First Ave. So., Seattle

BRONZE - BRASS - MONEL
TAIL SHAFT LINERS
PUMP LINERS - BUSHINGS

SANDUSKY FOUNDRY & MACHINE CO.
SANDUSKY, OHIO

CORDES BROS.
200 DAVIS STREET SAN FRANCISCO

FRANCE

TRADE MARK

"Thirty-Nine Years Satisfactory Performance"

Manufactured exclusively by

FRANCE PACKING COMPANY
Main Office and Factory
TACONY, PHILADELPHIA

Represented by
SAN FRANCISCO—HERCULES EQUIPMENT & RUBBER CO.
550 - 3rd Street—EXbrook 2575
SEATTLE—GUY M. THOMPSON
1241 Railroad Ave., South—Phone MAin 1870
PORTLAND—E. B. HUSTON
127 S. W. First Ave.—Phone ATwater 6754

There's no limit to *good times* in Hawaii . . . to her extraordinary tropic beauty . . . or her spontaneous hospitality! A unique vacation-land with an incomparable approach . . . your swift, delightful crossing on a graceful Matson liner. Hotel reservations at Royal Hawaiian or Moana at Waikiki are made at the same time as steamer bookings—a distinct convenience to Matson travelers.

FARES: *(each way) California to Honolulu*
FIRST CLASS *from* $125 · CABIN CLASS *from* $85

MATSON SOUTH PACIFIC CRUISES: To New Zealand and Australia, via Hawaii, Samoa and Fiji. *Personally-escorted* every four weeks. More than 17,000 miles of incomparable sailing; 48 days; 12 fascinating shore excursions. All-inclusive-cost, complete cruise, First Class, from $775.

SHIPPERS: The *Lurline, Mariposa, Monterey* and *Matsonia* provide swift freight service to Hawaii, with modern refrigeration facilities. The *Mariposa* and *Monterey* continue to New Zealand and Australia via Samoa and Fiji. Also regular and frequent freighter service from Pacific Coast ports. *Details from Travel Agents or:*

MATSON LINE · OCEANIC LINE

San Francisco Los Angeles
Seattle San Diego Portland

Progress of Construction

(Continued from Page 46)

LEVINGSTON SHIPBUILDING CO.

Orange, Texas

NEW CONSTRUCTION: **One all welded work barge** 92'x26'x6' 6", **delivered March, 1938.**

Two all welded petroleum barges 173'x39'x8' 6", for Pan American Refining Corp., Texas City, Texas. **Delivery date April, 1938.**

MANITOWOC SHIP BUILDING CO.,

Manitowoc, Wis.

NEW CONSTRUCTION: **One tanker** for Socony-Vacuum Oil Company, Inc., New York; 290'x49' 6"x20' 6"; 23,600 barrels capacity; 1500 H.P. twin screw diesel. Delivery date August, 1938.

THE MARYLAND DRYDOCK CO.

A Subsidiary of Koppers Company,
Baltimore, Maryland

NEW CONSTRUCTION: **One double ended steel diesel ferry boat,** 208' x 62' x 9', for the Claiborne-Annapolis Ferry Company; keel laid September 15, 1937; launched December 11, 1937; delivery date May, 1938.

THE NEW YORK SHIPBUILDING CORPORATION

Camden, N. J.

NEW CONSTRUCTION:

Three light cruisers; Hull No. 412, Savannah (CL42), Hull No. 413, Nashville (CL43), and Hull No. 416 Phoenix (CL46) of 10,000 **tons each for the** U.S. Navy Department; keels laid, 1935. **No. 412,** launched May 8, 1937; **No. 413** launched October 2, 1937; **No. 416 launched March 12, 1938.**

One destroyer tender for U. S. Navy; order placed December 27, 1937.

One seaplane tender for U. S. Navy; order placed December 27, 1937.

NEWPORT NEWS SHIPBUILDING & DRYDOCK CO.

90 Broad Street, New York

NEW CONSTRUCTION:

H360 aircraft carrier, CV6, Enterprise, for U.S. Navy.; keel laid July 16, 1934; launched October 3, 1936; delivery date May, 1938.

H361, light cruiser, CL47, Boise, keel laid April 1, 1935; launched, December **3,** 1936; delivery date July, 1938.

H362, light cruiser CL49, St. Louis; keel laid December 10, 1936; **launching date April 15, 1938;** delivery date April, 1939.

Hulls Nos. 363-364, two destroyers, Nos. 413, Mustin, and 414 Russell; keels laid December, 1937; delivery dates June and August, 1939.

Hull No. 369, twin screw mail, passenger and cargo liner for United States Lines Co.; length 723', beam 92', depth 45'.

Hulls Nos. 370, 371 and 372, three oil tankers for Standard Oil Company of New Jersey; gross tonnage about 11,500 tons; L.B.P. 525'; breadth molded 75'; depth molded 39'.

PHILADELPHIA NAVY YARD

Philadelphia, Pa.

NEW CONSTRUCTION:

Order placed for **DD404,** 1500 ton destroyer; no dates set.

PORTSMOUTH N. H., NAVY YARD

Portsmouth, N. H.

NEW CONSTRUCTION:

SS185 Snapper, submarine; keel laid July 23, 1936; L.B.P. 300', beam 26', loaded draft 15' 7"; launched August 24, 1937; commissioned December 15, 1937. **Completed March 1, 1938.**

SS186 Stingray, submarine; keel laid October 1, 1936; L.B.P. 300', beam 26', loaded draft 15'7"; launched October 6, 1937; **commissioned March 15, 1938;** date of completion June 1, 1938.

SS191, Sculpin, submarine; contract period started December 1, 1936; L.B.P. 302'6", beam 26'10", loaded draft 16'8"; keel laid September 17, 1937; completion date June 1, 1939.

SS192, Squalus, submarine; contract period started December 1, 1936; L.B.P. 302'6", beam 26'10", loaded draft 16'8"; keel laid October 18, 1937; completion date August 1, 1939.

SS196, Searaven, submarine; completion date February 1, 1940.

SS197, Seawolf, submarine; completion date April 1, 1940.

THE PUSEY & JONES CORP.

Wilmington, Del.

NEW CONSTRUCTION:

Two single screw, steel freight steamers for the Philadelphia and Norfolk Steamship Co., Philadelphia, Pa. L. O. A. 292', L.B.P. 280', beam 48'6", depth 32' 3", draft 18'; geared turbine drive 4000 S. H. P.; 2 water tube boilers. Delivery dates 12½ and 13½ months, respectively. Keel laid for first ship May 20, 1937; launched February 15, 1938.

Hull No. 1070, one steel hopper dredge, Chester Harding; 2,500 cubic yard capacity; length overall 308'2", length B.P. 300'0", breadth molded 56' 0", depth molded 29'0".

SUN SHIPBUILDING AND DRY DOCK COMPANY

Chester, Pa.

NEW CONSTRUCTION:

Hull No. 168, One diesel tanker for stock account, equipped with Sun-Doxford engine; 542'5" x 70' x 40'; 18,360 D.W.T. Keel laid August 19, 1937; delivery date June 1, 1938.

Hull No. 169, one oil tanker (steam), 520' x 70' x 40'; for Atlantic Refining Co.; 18,500 tons; keel laying date November 30, 1937; delivery date, August 1, 1938.

Hull No. 170, one single screw steam tanker for Bernuth, Lembcke Co., Inc., New York; length 462'4"; **beam molded 65' 0"; depth molded 35' 0", DWT** approximately 12,900 tons. Keel laid September 15, 1937; **launching date April 16, 1938;** delivery date May 1, 1938.

Hull No. 171, one single screw steam tanker for Tide Water Associated Oil Co.; 462' 4" x 65' x 35'; 12,900 **dwt.**; keel laid November 9, 1937; **delivery** date June 1, 1938.

Hulls Nos. 172, 173 and 174, three tankers for Standard Oil Co. of New Jersey; steam turbine; 525' x 75' x 39' 16,300 dwt. Estimated keel laying date No. 172, March 15, 1928; delivery dates April, 1939, November, 1939 and April 1940, respectively.

UNITED SHIPYARDS, Inc.

Staten Island, N.Y.

NEW CONSTRUCTION:

Hull No. 842; one ferry boat for City of New York; 267' overall, 66' extreme breadth, 19'9" depth; keel laid May 1 1936; launched December 20, 1937; **delivered March 23, 1938.**

Hull No. 852, one sludge vessel for City of New York, Department of Sanitation. Length on W. L. 250'. Beam 43'6", Depth 16'. Keel laying date July 22, 1937, launching date February 18 1938; **delivery date March 12, 1938 (estimated).**

Hull No. 856, fireboat for City of New York. Length O.A. 134' 0", breadth 32' 0", depth 13' 3". **Estimated keel laying date April 26, 1938;** estimated launching date July 14, 1938; estimated delivery date August 25, 1938.

Book Review

Knots, Splices, and Fancy Work, by Chas. L. Spencer; 195 pages, profusely illustrated, bound in blue buckram with gold stampings. Published by Brown, Son, and Ferguson of Glasgow; price $1.65 net.

This is a third enlarged edition of the author's standard work on the fascinating topic of the seamanly art of working rope. Every conceivable hitch, knot, splice, tackle, shank, bend, eye, plait, sennit, clew, lashing, sling, whipping, cockscombing, parceling, mousing and a hundred other varieties or using rope in its various forms for useful and/or decorative purposes, are described in simple words and illustrated by graphic figures in this volume. There are 360 illustrations.

Everyone interested in the salty flavor of old seafaring days or in rigging or model work should have this book. It brings the knot-makers art within the reach of any intelligent, patient person.

The most potent bulwark ever raised against scale and corrosion in the battle for efficient and economical marine boiler operation—

The HALL MARK signals victory for shipowners thus protected!

Today 224 vessels have eliminated mechanical boiler cleaning expense because their owners realize the value of the HALL SYSTEM OF BOILER WATER CONDITIONING.

The Hall Laboratories has earned the confidence and respect of every shipowner it is serving.

Bull & Roberts
117 Liberty Street
New York

Hall Laboratories, Inc.
981 Folsom Street
Phone GArfield 7027
San Francisco

Hagan Corporation
Bowman Building
Pittsburgh, Pa.

DOLLAR STEAMSHIP LINES

EXPRESS FREIGHT-PASSENGER AND REFRIGERATOR SERVICES

ROUND-THE-WORLD

ATLANTIC-FAR EAST

TRANS-PACIFIC

INTERCOASTAL

MEDITERRANEAN - U. S. A.

Dollar Steamship Lines Inc., Ltd.

ROBERT DOLLAR BLDG., SAN FRANCISCO - DOuglas 6000

OFFICES & AGENCIES THROUGHOUT THE WORLD

BOSTON
CHICAGO
CLEVELAND
DETROIT
LOS ANGELES

SEATTLE
NEW YORK
PORTLAND, ORE.
WASHINGTON, D.C.

Rezo Doors for Safety on Board Ship

The illustration herewith shows the construction of the fire resistant Rezo doors manufactured by the Paine Lumber Company and distributed to the marine trade by the Kearfott Engineering Company of New York. This door is designed and built to meet the new standards for fire proof ships recently introduced by the Bureau of Marine Inspection and Navigation of the U. S. Department of Commerce.

Not only are these doors fire resistant to a point greatly in excess of the Bureau requirements, but they are far stronger, much lighter, and much more free from distortion due to warping than are wooden doors of the commercial joiner type.

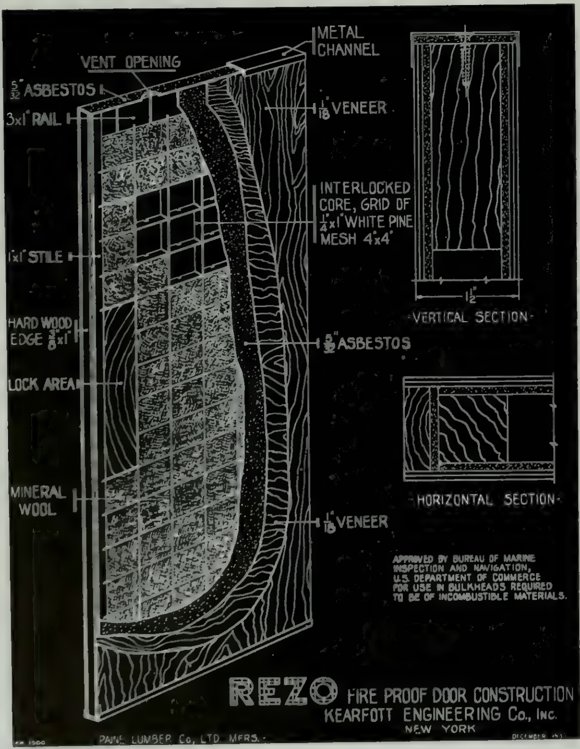
The foundation of this door is a grid of interlocking strips (one quarter inch by one inch) of white pine built up with a 4 inch by 4 inch mesh. The spaces in this grid are packed with mineral wool. Top and bottom the grid locks into a 1 inch by 3 inch rail, and on both edges into a 1 inch square stile. This assembly is overlaid with a sheet of asbestos covered by a plywood veneer. The edges are protected by a strip of 3/8 inch by 1 inch hardwood, and the ends by metal channels.

The cellular construction is vented to the air and allows this door to adjust itself to varying conditions of temperature and humidity by equalizing the expansion and contraction of its wooden members.

This type of door is furnished in styles and finishes to suit the use for which it is intended. It can be built: with or without ventilators; for hinged or sliding action; in enamel or natural wood finish; or in metal surface finished as desired.

Samples of these doors have been subjected to the most rigorous tests by the Bureau of Marine Inspection and Navigation, by the Forest Products Laboratory at Madison, Wis. and others, and in each case Rezo construction doors have received the highest fire resistance rating awarded to doors in their classification.

Installations of these doors on several Atlantic Ocean steamers, including the Normandie, have set new standards of strength combined with lightness and freedom from warping.


VENT OPENING
5/32" ASBESTOS
3x1" RAIL
1x1" STILE
HARD WOOD EDGE 3/8"x1"
LOCK AREA
MINERAL WOOL
METAL CHANNEL
1/16" VENEER
INTERLOCKED CORE, GRID OF 1/4"x1" WHITE PINE MESH 4"x4"
5/32" ASBESTOS
1/16" VENEER
1 1/2"
VERTICAL SECTION
HORIZONTAL SECTION
APPROVED BY BUREAU OF MARINE INSPECTION AND NAVIGATION, U.S. DEPARTMENT OF COMMERCE FOR USE IN BULKHEADS REQUIRED TO BE OF INCOMBUSTIBLE MATERIALS.
REZO FIRE PROOF DOOR CONSTRUCTION
KEARFOTT ENGINEERING Co., Inc.
NEW YORK
PAINE LUMBER Co, LTD MFRS.

Automatic Combustion Control on H. D. Collier

The steamship H. D. Collier is equipped with a complete system of Hagan automatic combustion control. The method of operation comprises, first, regulating the flow of air for combustion in accordance with variations in steam pressure; then measuring this air flow and from this measurement regulating the oil supply to the burners. The control equipment is designed to provide the greatest degree of flexibility of operation and at the same time to maintain a degree of simplicity that makes for reliable operation.

The supply of air for combustion is regulated by adjustment of the forced draft fan damper. The flow of air is measured by a metering regulator which sends to the oil control valve a loading pressure that is a measure of the air flow. This loading pressure acts on the oil control valve to regulate the supply of oil to the burners until a balance is established between the oil pressure on the burner tips and the loading pressure from the air metering regulator. Since the oil is regulated from the air flow, a failure of the forced draft fan causes the oil to shut off. This prevents spraying oil into the

Pacific Paint & Varnish Co.

Synthex Red Lead Primer (Q. D.)
" Anti-Corrosive
" Anti-Fouling
" White Enamel-Non-Bilge (O.S. & I.S.)
" Cabin Enamels (Q. D.)
" Mast Colors, Hull Black
" Boottopping, etc.

Synthex Marine Spar Varnishes and Yacht White Enamel

Aluminum Enamel

Flat White (Inside & Outside)

A specialized finish for each paintable surface.

Pacific Marine Finishes have been used successfully for years by most of the important steamship companies. Each represents a specially developed product for a specific purpose. Quality—not price—is the objective of our Research Department.

L. M. DuCOMMUN
President

San Francisco and Berkeley

A. B. ROBERTSON
Vice President

SWAYNE & HOYT, Ltd.

SHIPOWNERS and AGENTS
215 Market Street - San Francisco, California, U.S.A.

GULF PACIFIC LINE
(Between Gulf Ports and Pacific Coast)

CALMAR LINE
(Between North Atlantic and Pacific Coast)

YAMASHITA LINE
(Far East—New York—South America)

OFFICES:
Seattle - Portland - San Francisco - Oakland - Los Angeles - Chicago - St. Louis - Cincinnati - New York
New Orleans - Mobile - Birmingham - Houston

STOP **Slipping as well as leaks on boat decks . . . through installation of**

Case Weather Deck Covering

AN UNDER LAYER AND A NON-SLIP WEARING SURFACE

L.S. CASE CO.

INSTALLATIONS SINCE 1926 WITH LARGE FLEET OWNERS

L. S. CASE COMPANY

Applicators and Distributors
SAN FRANCISCO

7th and Daggett Streets

Phone: HEmlock 7821

BABCOCK & WILCOX BOILERS

Extra Values to Ship Owners and Builders

In DESIGN
Marine Boilers for Marine Service

In TRIAL RUNS
Experience Frequently Saves Money

In CONTINUOUS SERVICE
Regular Visits of B & W Service Men

The BABCOCK & WILCOX COMPANY, New York

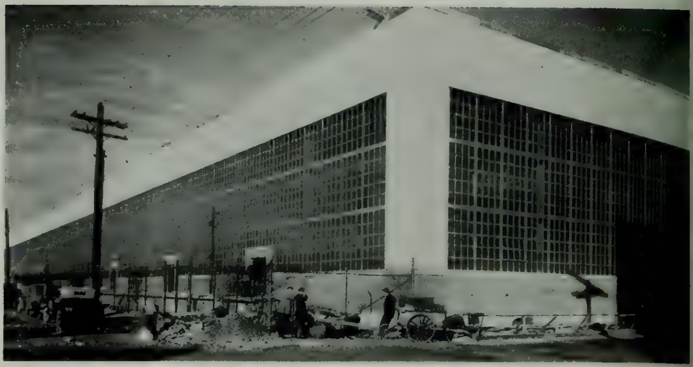
Pacific Coast Offices:
450 Mission Street - San Francisco
Seattle Portland Los Angeles

furnace unless air for its combustion is available. The oil control valve has a convenient manual adjustment for establishing the correct relation between air and oil supply when a change is made in the size of burner tips or the number of burners in service.

While the forced draft air damper is normally controlled from variations in steam pressure, a transfer valve and manual control hand wheel located on the operating panel enable the operator to secure manual control independently of steam pressure variations. A conveniently located indicator shows the operator the position of the forced draft damper at any time, whether on manual or automatic control. A similar indicator at the panel serves as a guide to the operator when the size of burner tips or the number of burners must be changed to meet unusual operating conditions, such as when entering or leaving port. This indicator may be calibrated to show the proper adjustment of the oil valve for each combination of burners and burner tips. The operator may, therefore, select the combination of burners and tips best suited to an anticipated load condition, and then by moving the adjustment hand wheel of the valve until the indicator points to the combination of burners and tips in service, the oil valve is correctly adjusted for the desired fuel-air ratio. This relationship will be maintained throughout the full operating range of the burners in service.

When at sea the load changes are not large, and may be secured without changing the number of burners or the size of tips. The operator may, therefore, set the control for the desired operating conditions, and fully automatic control will be maintained to take care of load variations resulting from weather conditions, soot blowing and evaporator operation.

All instruments, manual adjustments and manual control relays and indicators are conveniently mounted on the boiler panel. The operator, therefore, has before him a clear indication of all operating conditions, and has the means at hand for immediate manual control of any one or all of the controlled functions in case of emergency.



Bridgeport Brass Expanding

With its new rolling mill, representing an approximate investment of $4,000,000, rapidly nearing completion, Bridgeport Brass Company, one of the largest of America's independent brass mill products manufacturers, swings confidently into the 1938 scene.

The new mill covers a floor area of about 200,000 square feet, and will be devoted to the production in sheet form of practically all the copper base alloys. It has special significance when viewed from two different standpoints. First, its construction has already given direct employment to an average of over 150 men per day since May 1, 1937, and provided a total of more than 28,300 man days' work during the past ten months, and has involved the purchase of important quantities of building materials and the creation of labor in many fields at a time when such activity is needed. More than 1375 tons of structural steel, a total of more than 400,000 bricks, over 28,000 lights of glass with a sash area of 50,400 square feet, materials for 166,000 square feet of roof area and enormous quantities of other materials were utilized in the construction of the plant and adjoining office and laboratory building. An equally substantial outlay has been made for the purchase of modern machines, equipment and tools.

Second, it is important as an interesting departure from conventional brass rolling mill design. The direct flow of materials is the integral factor. In addition to allowing for the use of the most modern machinery and equipment available, it is planned with an eye to the growing importance of materials handling in efficient plant operation.

In this respect it is the most thoroughly systematized plant yet constructed in the industry and follows the straight line principle which has proved to be so effective in the steel industry. Smooth, continuous flow of metals throughout all stages, from ingots to finished rolls, automatic devices for handling to insure the utmost speed and economy, ready adaptability to varying production requirements—these are the outstanding features of the mill. Every unnecessary movement in the various steps—rolling, scalping, annealing, pickling, coiling, slitting, finishing and loading for shipment—has been eliminated to avoid waste of time and effort.

Bottom Paint Protection for Standard Tankers

Protection for the underwater surface of the hulls of the new Standard Oil of California tankers H. D. Collier and W. H. Berg, was accomplished through the application of American Marine Paint Company's Germicide anti-corrosive and antifouling compositions.

PACIFIC MARINE REVIEW

AY

938

Outer Harbor Terminal — Port of Oakland

You can't fool a *good* Fisherma
on his Tackle

You bet the real fisherman knows his tackle! By even a hasty examination of a rod and reel he can tell yo with what accuracy it will flick his favorite fly over the trout stream.

So, too, can the trained Marine man tell about the quality of many products used aboard ship. But even th most careful examination can tell him little about the quality and dependability of the rope his ship requires.

That is why in the purchase of rope different methods must be employed. The major consideration must b given to the reputation of the manufacturer and his product.

For 82 years the mills of the Tubbs Cordage Company have been making Marine rope that has been th acknowledged leader on the ships of the Pacific for dependability and safety. Make this background of prove skill and ability your guide the next time you select a Marine line. It assures you of greater rope value fro every standpoint!

Specify Tubbs Marine Rope—tape identified for your protection—
SUPERCORE — EXTRA SUPERIOR MANILA.

TUBBS
ROPE

TUBBS *Cordage Company*
200 BUSH STREET, SAN FRANCISCO

PACIFIC MARINE REVIEW

MAY 1938
OL. XXXV NO. 5

CONTENTS

Editorial Comment:
Too Many Laws ... 17

"Let's Start Rebuilding Our Merchant Marine in 1938" ... 18
IV. Some Comments on the Proposal to Build Our Ships Abroad.
By Ernest E. Johnson.

Port of Oakland Reports Good Progress ... 21

"The Old Lady of Port Phillip" ... 24
Edina, World's Oldest Screw Steamer.

Your Problems Answered ... 26
By "The Chief".

Steady As You Go ... 29
For Deck Officers.

J. W. Van Dyke ... 32
World's Largest All Welded and Highest Steam Pressure Tanker.

The Short Oil Detector ... 37

Ocean Tug Sea Giant ... 38

Spunyarns and Catharpins ... 40

Transoceanic Aviation ... 41
By Grover Loening.

Shallow Draft Dredging Equipment ... 42

On the Ways:
Latest News from American Shipyards ... 46
Building in American Yards ... 49

1937 Marine Safety Awards ... 51

Propeller Club News ... 54

Miscellaneous: Engineers' Licenses, 28; Trade Literature, 36; Tube Cleaners, 36; Combustible-Gas Indicator, 39; Complete Gasket and Packing Service, 44; Book Reviews, 44; Montague Seagoing Ranges, 45; Literature of the Industry, 60; Caterpillar Marine Diesel, 62; Arc Welding Machine Goes Fishing, 62; Definition of Metal Spray, 64.

Our Frontispiece

Our frontispiece this month is made from a photograph of the American four masted ship Star of Shetland under full sail.

The Star of Shetland was formerly the Edward Sewall and was built at the Sewall yard, Bath, Maine, in 1899. Her hull was of steel and her dimensions were:

Length	332 feet
Beam	45 feet, 3 inches
Depth	25 feet, 5 inches
Gross Measure	3345 tons
Net Measure	2850 tons

After serving for some years in the Sewall line she was renamed Samuel Sewall and in 1915 was sold to the Texas Oil Company. After service in oil for six years she was sold to Alaska Packers Association in 1922 and thereafter made annual voyages out of San Francisco to the Alaska salmon fisheries. In 1933 she was laid up in Oakland estuary with others of the A. P. A. sailing fleet, and in 1936 was sold to Japanese interests as scrap steel.

UBLISHED AT 500 SANSOME STREET . . . . SAN FRANCISCO

ntered as second class matter June 20, 1913, at the post office, San Francisco, under the Act of March 3, 1879. Published on the 1st of each onth. Advertising and editorial forms close on the 15th. Subscription price, one year: Domestic, $1.50; foreign, $2.50; two years: Domestic, 50; foreign, $4.00; three years: Domestic, $3.00; foreign, $5.50; single copies, 25c. Chas. F. A. Mann, Northwest Representative, 1110 get Sound Bank Bldg., Tacoma, Washington. New York Office, Suite 404-405-406, Two Hundred Broadway, Telephone COrdlandt 7-3579.

New York City copies of Pacific Marine Review can be purchased at the news stands of I. Goldberg, 42 Broadway; Jacob Fuchs, 17 Battery ace; Philip Mandara, Greenwich Street and Battery Place. In Washington, D.C., at the news stand of the Carlton Hotel, 16th and K Streets.

J. S. Hines
sident and Publisher

B. N. DeRochie
Assistant Publisher

Alexander J. Dickie
Editor

Paul Faulkner
Advertising Manager

F. Dryden Moore
Assistant Editor

PACIFIC MARINE REVIEW

VOLUME XXXV MAY 1938 NUMBER 5

Merchant Marine Needs Less Law—More Help

A harassed shipowner testifying before a congressional committee in 1935 called attention to the fact that there were then pending before the Congress more than 150 new laws or amendments to existing laws more or less vitally affecting the American Merchant Marine. An analysis of those laws showed that only two were even claimed to be offered for the purpose of making American ship operation more attractive or more profitable.

That condition was not new in 1935 nor is it outmoded in 1938. The number of such laws proposed each year is not diminishing nor is the proportion of beneficial legislation getting greater.

Today congressional committees are mulling over a flood of new bills or amendments to existing acts concerned with labor questions, subsidy, working conditions aboard ship, ideas for maritime safety, corporation restrictions, Government operation, profit limitation, tax increase, tariff alterations, canal dues, and so on ad infinitum, most of which affect American shipping adversely so far as cost of operation is concerned.

Meanwhile, it is very evident that the U. S. Maritime Commission does not intend to give any financial aid to any American shipowner or American shipbuilder if it can legally withhold such aid.

Listen to the Hon. Joseph P. Kennedy, U. S. ambassador to Great Britain and former chairman of the U. S. Maritime Commission, speaking on March 31 to the 61st annual meeting of the Chamber of Shipping of the United Kingdom:

"As you are no doubt aware, we are having considerable difficulty in getting new ships. Construction prices in the United States are outrageously high. The Maritime Commission has recommended that whenever American prices are more than twice those available abroad, construction should be given to foreign yards. President Roosevelt has praised this plan as 'sensible' even though it may not be politically expedient.

"*My government has no intention of giving the American operator any advantage over his competitors.* If he cannot survive when placed on an even footing with foreign operators he has no right to stay in business. The problem then becomes, as I see it, the exclusive concern of government. . . .

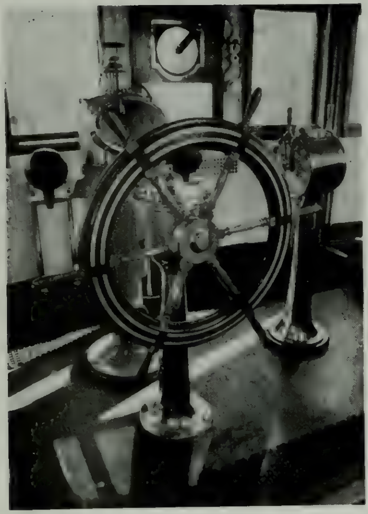
"Foreign shipowners have little to resent and no reason to fear the maritime policy of the United States."

Do these two statements, "no intention of giving the American shipowner any advantage" and "Foreign shipowners have no reason to fear" correctly express the present policy of Washington with regard to the American ship operator?

If so, they do not indicate any great determination to carry out the mandate of Congress as expressed in the Merchant Marine Act of 1936 and in all similar acts of the past 35 years, i.e., to build up an adequate American merchant marine under the ownership and management of American citizens.

Certainly the Maritime Commission, by withdrawing several American lines from foreign trade on both coasts, has turned over a very considerable amount of cargo tonnage to foreign flag ships which was formerly carried under the American flag. This action by the Commission has turned onto the beach many American seamen and officers and put in the idle class a considerable number of shipyard workers.

Perhaps Congress should declare a holiday on maritime laws and devote some attention to steering the Maritime Commission into a course that is 100 per cent American.



"Let's Start

Our

By
Ernest
E. Johnson

IV. *Some Comments on the Proposal to Build Our Ships Abroad*

Some years ago, when we were examining bids made on a particular ship and the American bid was three times higher than the lowest foreign bid, a shipping man exclaimed:

"What would I not give to spread it all over the United States that we do not want a subsidy! Let us build where the ship can be produced the cheapest, and let us operate under conditions equal to our foreign competitors! Then we will have a real American merchant marine."

But would we? Certainly we would have the ships. And they would sail the seas; they would protect and build up American trade; they would bring us raw material for manufacture, the goods we do not produce, and they would spread our surplus products in all parts of the world. Then what?

The ships are built abroad and our shipyard labor, our technicians, and our facilities are swept clean from our ports. Repairs are then greatly done abroad, and these facilities, too, become decadent. And the labor to produce the material for shipbuilding, located in every state in the Union, also suffers accordingly.

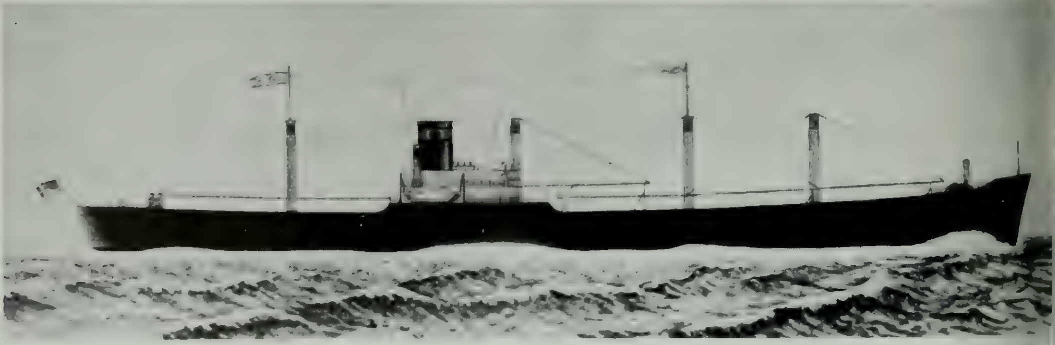
We employ Oriental or Philippin crews, and the American-born o naturalized citizen must seek elsewhere to gain his livelihood. The what?

Did you ever see or hear the wor "War" or the words "National Emergency"?

But perhaps we idealistically consider War and National Emergency bugaboo, a chimerical obsession, condition that cannot possibly happen to the United States. Why, sa you, we are self-sufficient, and geographically safe. Then why th Navy? Why talk about the bigges navy in the world? And why an ship at all? Surely, if we are self sufficient, we can all stay at home and be happy.

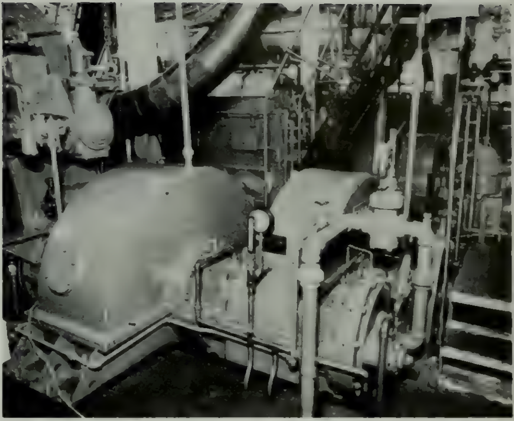
No, a thousand times no! It is no as easy as all that. We are a peaceful nation. Certainly. We are a ric nation. But yes. That is the combination that spells a big navy, and a armed force to repulse. Rich, peaceful, and self-indulgent, with n thought to safety, is the road to disaster. The "have nots" mobilize t take what the "haves" possess.

So we have the big navy. And w



Artist's conception of the U. S. Maritime Commission standard C-2 cargo vessel design.

Rebuilding Merchant Marine in 1938„



have the foreign-built ships, with cheap foreign crews; and we are happily engaged in peaceful penetration.

Suddenly there is a war elsewhere. It spreads until it is a general conflagration. We are sucked into it. And puff goes our idealism. We are forced to face facts. Ships are torpedoed and damaged. Oriental crews desert the ships. They, too, are peaceful. Extra wages induces them and It is not their home that is in danger. Ships are damaged. We have no strong facilities or men to repair them. Ships are sunk. Foreign yards are busy for themselves. We cannot replace them. The Navy is greatly handicapped without ships, ships to deliver supplies, act as hospital ships, and ships that may serve as auxiliary cruisers, acting as convoys, thus releasing navy ships for more serious duties.

nd what about the army? The best defense is often an attack. Troops must be transported. We have some ships, but no crews. So we take naval men, intersperse them with new men, and send them to sea. We need more ships, so we take men from all ranks of life, build the yards, provide housing, transportation, training, and, very belatedly, perhaps when the crisis is over, we begin to launch a fleet of ships that are costly and built under conditions that force waste and disregard ultimate peacetime use. That is history —recent history.

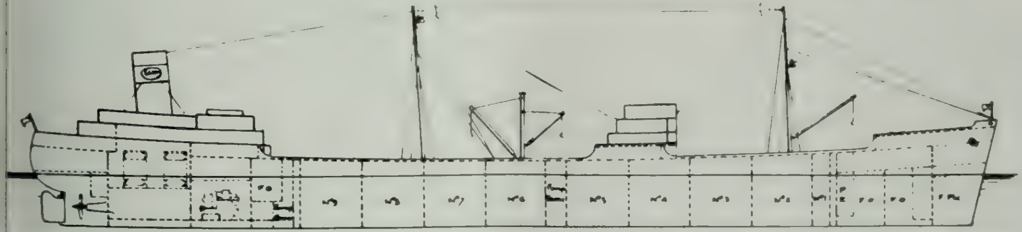
We have surrounded ourselves with tariff walls. We have built up a national standard of living unequalled elsewhere. And now we have applied safety measures, defense measures, and working conditions that make ships prohibitive in initial cost. It is but natural and almost inevitable that the cry should be renewed to "Build Ships Abroad."

Some of the conditions can be remedied, with resultant lowering of costs. And ship labor, both ashore and afloat, must do its share to protect both its own and the national interest. For the rest, a modified 1936 Merchant Marine Act must suffice and be made workable. Equality with foreign competition must be attained, until our own minimum needs are provided. These are defined and readily ascertained. Then it is a case of keeping up to date.

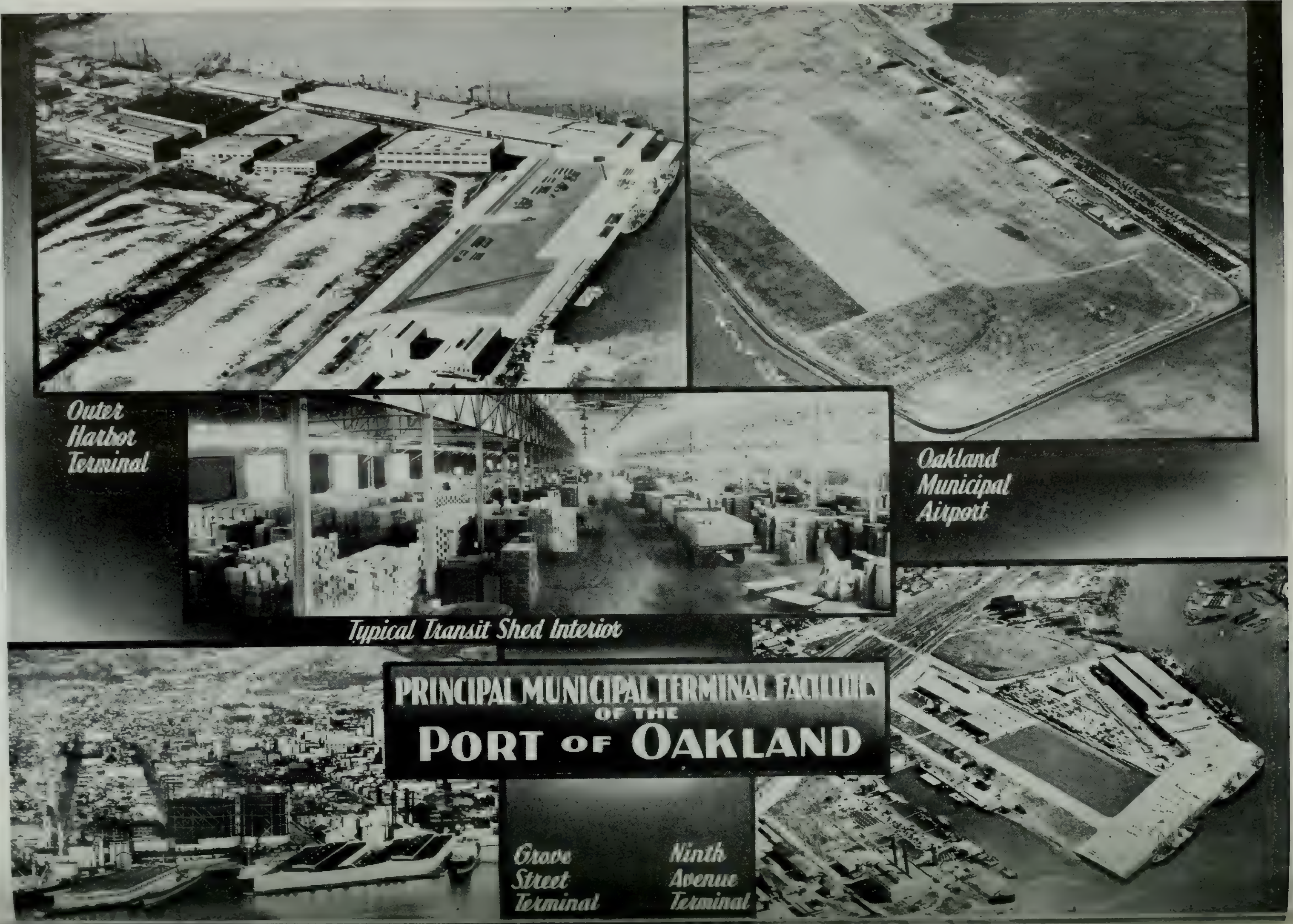
This merchant marine problem is not new. It is older than the nation itself. It was a Colonial problem. The Revolution of the American Colonies was certain because of shipping discriminations. The nation became a unit because of it. And the first Acts of the great statesmen of the day concerned it. They dealt with it firmly and effectively. And they also considered the problem of "Building Ships Abroad." This is what our revered and practical Thomas Jefferson thought on the subject:

"For a navigating people to purchase its marine afloat would be a strange speculation, as the marine would always be dependent upon the merchant furnishing them. Placing as a reserve with a foreign nation, or in a foreign shipyard, the carpenters, blacksmiths, caulkers, sailmakers, and the vessels of a nation, would be a singular commercial combina-

(Page 28, Please)



Profile of the U. S. Maritime Commission fast tanker design. Twelve of these are now under construction in Atlantic Coast shipyards.



PRINCIPAL MUNICIPAL TERMINAL FACILITIES OF THE PORT OF OAKLAND

Port of Oakland Reports Good Progress

Ten Years of Operation Under Municipal Management Shows Substantial Gains in Industrial and Shipping Expansion

summing up the accomplish- ts of a decade of public owner- and management at the Port of land, California, A. H. Abel, Chief ineer and Port Manager, avers: Ten years of municipal operation he Port of Oakland and its facili- by the Board of Port Commis- ers have brought about the con- ction in our harbor of some of finest marine terminals on the fic Coast, which, in turn, ugh the maintenance of operat- efficiency, now enjoy a patron- that triples that of a decade ."

he Port of Oakland is singularly unate in owning unusually large ts of shore lands and tidal flats ly convertible into very fine in- rial sites with both rail and deep connections. Port improvements ned and built during the past ten s have been strategically located rovide the development of these s, and all planning of the Port mission is made with the long re in view.

he Commission or Authority gov- ng this port consists of five com- ioners who are appointed for a of six years by the mayor, sub- to the approval of the city coun- The board, composed of these missioners, elects its own presi- , vice-president and secretary, ints an attorney, a port manager other officers, and exercises com- control over that portion of City of Oakland known as the Area. It is the present policy he board to itself construct all rves and piers, railroad tracks other major facilities, and to icly operate the same. Before this policy was adopted there existed many privately constructed terminals and other structures situated on lands owned by the Port Commission. On these the Commission collects rentals.

James J. McElroy, president Board of Port Commissioners, Port of Oakland.

This policy was inaugurated ten years ago and its consistent application under able management has resulted in a remarkable growth in facilities and in business.

In 1928 the Port Commission first assumed direct operation of Oakland's municipally owned terminals. The volume of cargo passing over the municipal piers of Oakland in that year aggregated 316,377 tons. The comparative figure for 1937 was 1,166,664 tons, or a threefold growth in ten years. This is all the more remarkable when we consider that five of these years were the great depression period. The average gain over the 10-year period was approximately 85,000 tons; the gain of 1937 over 1936 was 96,108 tons. During all of this ten-year period the Port Commission has carried on extensive port improvement work, and has maintained existing facilities in excellent condition.

On February 12, 1937, the first Board of Port Commissioners of the City of Oakland took their respective oaths of office. At that time the Port of Oakland was a local port with no regular foreign steamship service, infrequent service from domestic lines, and handling principally bulk cargoes. There was not one municipally-owned fireproof terminal in the harbor.

Today the harbor is a port of recognized world importance, enjoying scheduled service by ships of major foreign and domestic lines and handling a wide variety of general cargo, composed principally of manufactured and processed goods. The municipally-owned terminal facilities, built, maintained and operated by the Board of Port Commissioners, are of fire-resistant construction and all are sprinkler-equipped throughout, with the result that Port of Oakland shippers have the benefit of the lowest insurance rates in the United States.

This betterment of Oakland's shipping status may be attributed to several causes. For one thing, shippers have been loyal and have supported the municipality in its endeavors to render a superior and dependable shipping service at its terminals.

Board of Port Commissioners, Port of Oakland. Left to right, sitting: Eugene W. Roland, vice president; Ralph T. Fisher; James J. McElroy, president; Dr. James C. Pardee; and Frank Colburn, vice president. Standing: A. H. Abel, chief engineer and secretary; and Markell C. Baer, port attorney.

Above: Four views showing the loading of a disassembled gold dredge on the American freighter Point San Pablo for transshipment at Seattle to an Alaska steamer.

At right: Large vessels loading at outer harbor.

And of great importance, too, has been the system of port management which was chosen by the citizens of Oakland, when the charter was amended in 1926.

● Past Members.

Before outlining the work which has been carried out by the board, mention should be made here of the men who have served as members of the Port Commission in addition to the present personnel. The past members and their terms are: Roscoe D. Jones, February 12, 1927, to August 14, 1928; H. C. Capwell, February 12, 1927, to July 9, 1929; Ben H. Pendleton, February 12, 1927, to July 10, 1933; Sherwood Swan, January 31, 1930, to July 10, 1931; Leroy R. Goodrich, July 10, 1931, to July 10, 1937; R. A. Leet, February 12, 1927, to July 10, 1937; Stuart S. Hawley served on the temporary Board o Port Commissioners which in 192 carried on the preliminary organiza tion of the Port of Oakland.

Upon its organization, the firs move of the Port Commission was t get a construction program unde way in order to provide proper facili ties for the handling of commerc The cost of this new constructio was to be borne by the proceeds o the sale of harbor bonds and it wa contemplated that the $9,960,00 would be expended at the end of five year period of building.

The Board of Consulting Engi eers had recommended that termina development be undertaken on th western waterfront at the foot Fourteenth Street; in the Inner Ha bor at the foot of Grove Street; an in the Brooklyn Basin at the foot Ninth Avenue.

fficient Management.

ince 1927 adequate terminals he been built and put in operation a these points, adding over 7,000 liar feet of berthing space to the pt's facilities. The Commission has ao acquired land by outright purcse and developed the famous Oakld Municipal Airport. It has constucted a special facility for inland wterway carriers at the foot of Wbster Street and provided a yacht hbor at the foot of 19th Avenue. Csiderable additional acreage of hbor lands has been acquired by pchase.

ith all this accomplished the Cnmission still has on hand appximately $700,000 of the original $960,000 bond issue—an issue of wich the voters anticipated that it wuld be exhausted in five years.

his accomplishment was made psible only by very efficient management, exceedingly competent engeering, and the loyal support and cperation of shippers which made itpossible to use port earnings to hp finance improvements.

ay Rolls for Oakland

t is difficult, of course, to determe exactly what are the direct and iirect pay roll results attendant on a large activity. In addition to the dect pay rolls brought by the large hbor and pier construction there isnow an average of 1300 persons idaily employment under private oanizations operating at municipal pt facilities or at private establishnts located on port lands. The mnicipal employees at port facilities number 117.

At the Oakland airport there are 11 municipal employees operating this port facility, which makes jobs for 315 persons in private organizations located at this facility.

● Future of Port

An indication that the harbor is destined for great future progress is to be found in the action of the Navy Department in selecting Oakland as the location for its Pacific Fleet Supply Depot, following a survey of the entire Pacific Coast. The negotiations of the Navy Department for 390 acres of Middle Harbor tidelands were carried on with the board and in turn the proposal was submitted for approval at the last general election, when an overwhelming vote was cast in favor of the transfer of the site to the Government.

● Bridge Overpass

Recently the board completed negotiations with the Toll Bridge Authority for the construction of an overpass on the western waterfront, to connect the Outer Harbor area directly with the bridge, and this work is now under way. This overpass is needed now and will continue to be of increasing value as the business of the port grows.

Continuance of support on part of the public and continuance of the efficient and businesslike management of the harbor on the part of the Commissioners will insure the building up of a greater Port of Oakland, whose progress during its second decade should far exceed the first ten years' record of achievement.

Above: Upper view shows ship's tackle handling a tractor; lower view shows Haviside derrick barge unloading heavy cast iron pipe sections.

Below: Four views at Oakland municipal piers, showing ships of many nations loading and discharging cargo.

"The Old Lady of Port Phillip"

An Interesting Short History of the World's Oldest Screw Steamer, the Edina, Compiled with the Assistance of Lloyd's and of F. E. Edwards

On the 4th of May, 1854, at the famous shipbuilding yard of Barclay Curle & Company on the Clyde, there was launched an iron hull screw steamer which was christened Edina (the poetic form for Edinburgh). This steamer has retained her name through eight decades and is still in active service at Melbourne.

The following account of her long and interesting history was furnished to Pacific Marine Review by Mr. B. P. Fielden, surveyor for Lloyd's Register of Shipping at Melbourne, through the courtesy of Dave Millar, surveyor for Lloyd's at San Francisco. Much of this material is from the book "The Romance of the Edina," by C. Dixon Gregory of Melbourne.

Naturally, a ship with such a long history has endeared herself to thousands of ship lovers on and about Port Phillip and her name has become a household word all over Australia. When, therefore, an imported announcer on a Melbourne broadcast referred to this old favorite as if her name was spelled Edeena, it brought in a storm of protest, and in a few days the Melbourne Herald featured the following whimsical rhyme:

Heegh Teed

It was the good Edeena
That sailed Coreeo Bay,
The teed was reesing slowly
Neeght fell at close of day.
A peelot in his leefboat
Raced past in leevly steel
To board a leeted leener
She'd come full many a meele.
He heeed him to her skipper
And creeed in accents weeld,
"Ee've sailed the breeny ocean
On seas both stern and meeld
Out yonder is a sheep that's known
To eeslands o'er the sea,
But before Ee'll say Edeena
Ee'll lay me down and deee."

Edina has never had any addition to or subtraction from the original dimensions of her hull. She was and is:

171 feet in length
23 feet 6 inches in beam
12 feet 7 inches in depth.

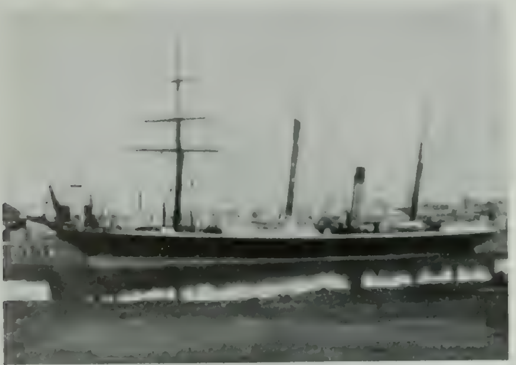
Her original gross tonnage measurement was 322 tons. Lloyd's now lists her as 380 tons gross, 289 underdeck tonnage, and 223 net tonnage, the additional gross measurement being due to an enlarged poop.

The first commission of Edina in the British Mercantile Marine was trading, for about eight months, between Leith, Hull and Hamburg.

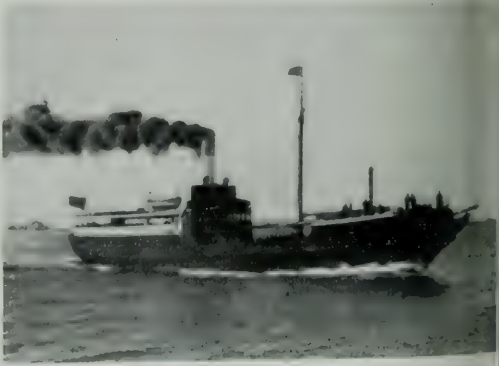
Soon after she commenced running the Crimean War broke out and, on the 28th February, 1855, she was requisitioned by the British naval authorities for transport duties—not as a troopship, as is frequently reported but as a carrier of horses and provisions to the Black Sea. Later, however, her accommodation was altered and enlarged and she was able to convey forty officers and some nurses to the Crimea. It is reported that, on her last trip to the Crimea, she rammed a Russian ship. It is believed that the famous Florence Nightingale was one of the many persons who lived on the vessel during those days.

In 1856 Edina reverted to mercantile service and, for the following five years, she was engaged in peacefu trading.

On 23rd November, 1862, Edina left Leith for Melbourne under the command of Captain Andrew Whyte and carried cargo only. She arrived in Hobson's Bay on the 7th March 1863, having taken 104 days for the trip, made entirely under canvas. Callender & Co. were the agents. She had three masts and was square rigged on the foremast; in fact, she was really a large steam yacht, and he



S.S. Edina in her original rig.



S S. Edina as she appears today.

ht lines can still be viewed.

On arrival at Melbourne, she was bought by the late Mr. Stephen G. Henty and entered the Western District trade, i.e., between Melbourne, Warrnambool, Belfast (now Port Fairy), and Portland.

During the Otago gold rush she was diverted to the New Zealand trade, to carry numbers of gold miners and prospectors, live stock and cargo. She made exceptionally quick passages, her average being five and a half to six days from Melbourne to the Bluff. On one of her trips she completed the round voyage in sixteen days, Melbourne to Port Chalmers, three and a half days of which were spent at Dunedin.

The following is an interesting one of the shipping advertisements: "Steam to Otago. The fine powerful steamer Edina, Captain Rolls, will be despatched on Saturday, November 7th, 1863, for Port Chalmers, calling at the Bluff, with passengers for Invercargill. Cargo received at the Queen's Wharf. Apply early for shipping orders to S. G. Henty, and for passage to Dodd, Thompson & Co., 2[illegible] Queen Street."

Also the following press cutting from one of the daily papers of 5th November, 1863, refers to the ability of the steamer: "The Edina will in all probability be retained in the New Zealand trade, her good accommodation (passenger) and rapid trips of 5½ to 6 days recommending her as a very suitable vessel."

It may be noted that on one trip she carried no fewer than 350 passengers and later returned with 60 passengers and 20,000 ounces of gold.

When the New Zealand trade began to wane, the Edina resumed, in conjunction with the steamer Western, the service to Warrnambool and Western District ports.

On the occasion of the visit of H.R.H. the Duke of Edinburgh to Melbourne in November, 1867, the Edina was one of the fleet of 25 vessels chartered by the government to escort the visitors up Port Phillip Bay.

In 1873 she was purchased by Messrs Howard Smith & Sons, now Australian Steamships Pty, Ltd., and, after an extensive overhaul, she was sent to Queensland and traded on that coast until 1879, when she returned to Melbourne and was placed out of commission for 12 months. During this period she was greatly altered to suit the Geelong trade; her hull and rig underwent great changes, a poop was built at the stern and two masts removed.

On the 1st May, 1880, she made her first trip to Geelong, almost a new vessel in appearance, and entered into competition with the Alert. In 1882 she had to compete with the new steamer Excelsior.

In September of that year her owners decided to install new engines and boilers and the vessel was withdrawn from the trade. Her hull was completely gutted and she emerged quite different from her former appearance, having two masts.

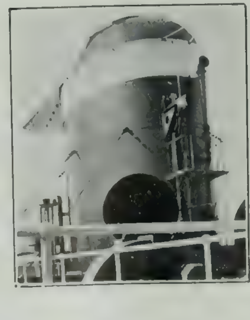
She temporarily returned to trade on the Queensland Coast, but in 1887, when the Courier entered the Geelong trade, the Edina was brought back to compete with her, and they proved worthy rivals for many years.

The steamer Geelong, during the years 1883-1887, had replaced her in the Bay trade, but on the return of the Edina the Geelong went to trade on the Queensland coast and was wrecked there twelve months later.

Shortly after entering the Geelong trade, Captain Forbes had been placed in command of the Edina, and he remained in this position for the next forty years, when he was relieved in 1922 by the present master, Captain Moxey.

She continued in the Geelong trade and amonst her many rivals were the steamers Despatch, Alert, Excelsior, Coogee, Ozone, and Currier. Of these, the Excelsior still visits Geelong, but now as a wool lighter towed by a small tug.

On the 27th April, 1898, the Edina collided with the Manawatu off Williamstown. The latter vessel sank, although the Edina was only slightly damaged and was beached near Pt. Gelliband. No lives were lost.



Then, fifteen months later, on the 11th July, 1899, when off Point Cook, she crashed into the Excelsior during a heavy fog. The Excelsior sank in deep water and was raised some nine to twelve months later. The Edina was badly damaged but her fiddle bow saved her from sinking with the other vessel.

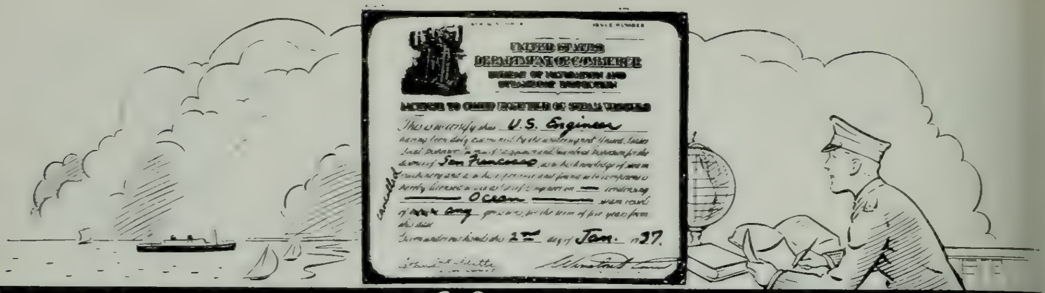
She continued running in the Geelong trade until just prior to the Great War, when she was relieved by the fine passenger steamer Mourilyan. The Edina was laid up for some months and then, in 1917, the owners decided to completely overhaul and renew her, owing to the high cost of building new steamers. The vessel was dismantled and rebuilt, and resumed in the Geelong trade looking like a new steamer.

On the 9th July, 1928, the Edina collided at the mouth of the Yarra with the steam tug Hovell, which sank, and once again she sustained very little damage and was able to continue her voyage to Geelong.

We have been unable to confirm several incidents which occurred early in her history, and one which is frequently mentioned is that in 1863, during the American Civil War, she acted as a blockade runner, bringing bales of cotton from Galveston to England. The date mentioned does not agree with her departure from England for Australia.

The figurehead which once adorned the prow was a fine example of handiwork, representing "Edina, Fair Maid of Judea." Unfortunately it was splintered to fragments in a collision at Warrnambool, when the Dandenong drove on to the Edina's bows while she lay at anchor riding out a gale.

During her long career and her many overhauls and alterations, her external measurements, as mentioned above, have never been altered since the day she was built. She has had three pairs of boilers and two sets of engines and still speeds along at ten knots. Today, after 83 years, the wonderful little craft, with the regularity of clockwork, still performs her daily task to Portarlington, Geelong, and return.



UNITED STATES
DEPARTMENT OF COMMERCE
BUREAU OF NAVIGATION AND
STEAMBOAT INSPECTION

LICENSE TO CHIEF ENGINEER OF STEAM VESSELS

This is to certify that U.S. Engineer … San Francisco … Ocean … any … 2nd … Jan. … 37.

Cancelled

Your Problems Answered

by "The Chief"

The word "Cancelled" was inscribed on face of the above license at the direction of the Bureau of Marine Inspection and Navigation. As used here it means "Specimen Copy."

To Every Man on Every U.S. Ship

Twenty-five years after Robert Fulton operated the first steamboat (the Clermont, in 1807) 14 per cent of the steamboats operating were destroyed by fire in one year, with a loss of life of over 1000 persons. Subsequent years saw even more destruction. The giant, "steam power," had not yet been fully mastered.

This year marks the one hundredth anniversary of the founding of the Steamboat Inspection Service, in 1838. Now operating under the U. S. Department of Commerce as the Bureau of Marine Inspection and Navigation, this bureau maintains inspectors and examiners in nearly every large port of the United States. These men are all highly qualified in their respective fields of marine engineering, naval architecture and navigation.

Although necessarily clothed with authority to reject, condemn, or tie up vessels or equipment, one of the aims of this bureau is to elevate, promote and educate the merchant marine crew. The examiners should be looked upon as teachers who want you to learn, and not as police daring you to pass.

I suggest that we all make this an occasion for taking every opportunity of getting better acquainted with the marine inspectors.

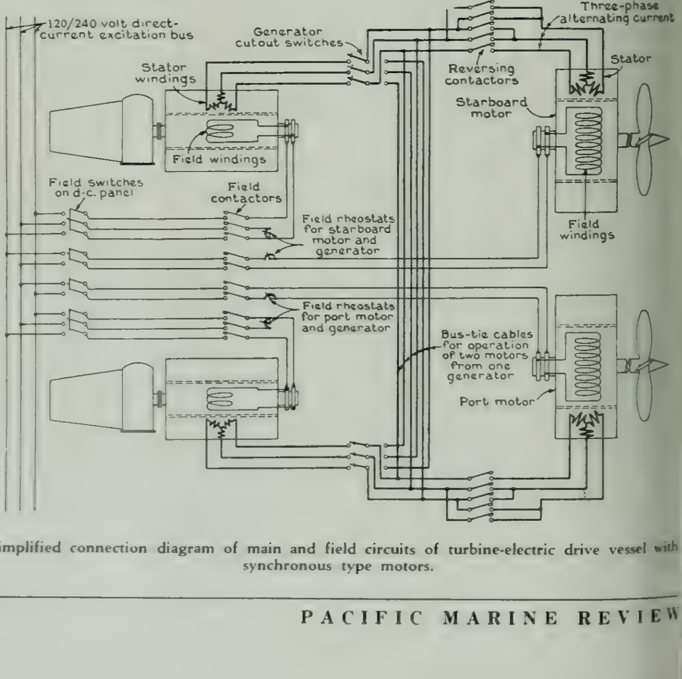
Sincerely,
"The Chief."

Electric Ship Propulsion

Too frequently the thought is expressed that if an idea or scheme is superior in a particular case it must be best in every case and at any time. This is illustrated by the thought sometimes expressed that eventually all ships will be electrically driven. Remember in considering this subject that all electric ship propulsion drives are merely auxiliary to a steam turbine, a steam reciprocating engine, or a diesel engine.

Opinions differ, but in general we will probably always have diesel drive, reciprocating steam drive, turbine drive, electric drive and special combinations. This is because each has its own individual advantages and characteristics.

There is a place for electric drive,


120/240 volt direct-current excitation bus
Generator cutout switches
Three-phase alternating current
Stator windings
Reversing contactors
Stator
Starboard motor
Field windings
Field switches on d-c. panel
Field contactors
Field rheostats for starboard motor and generator
Field windings
Field rheostats for port motor and generator
Bus-tie cables for operation of two motors from one generator
Port motor

Simplified connection diagram of main and field circuits of turbine-electric drive vessel with synchronous type motors.

but it probably will not supplant geared drive. Also, time brings new improvements. When the electric drive was first put into actual use in pre-war days the reduction gear was not the reliable machine it is now. For a while it appeared as though the electric drive was the only way to economically connect turbines to propellers when the horsepower was over 10,000.

QUESTION

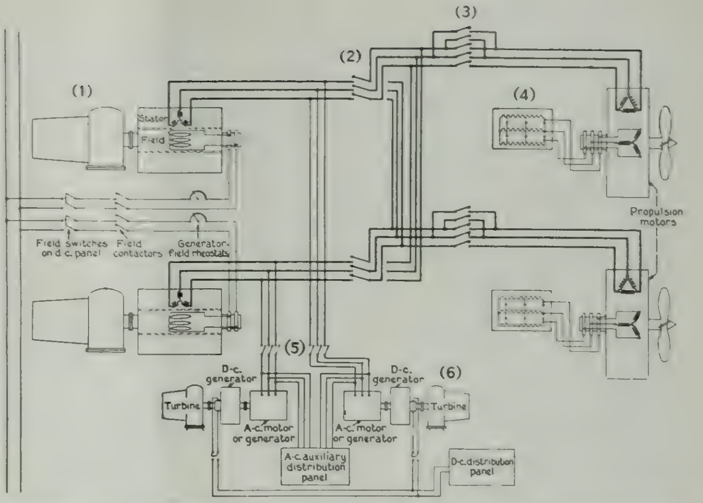
What is electric propulsion and how is it accomplished?

ANSWER

Electric drive takes advantage of the fact the generator and motor connected to the same electric system may run at entirely and widely different speeds and be located independently of mutual alignment or mechanical relationship. This gives great flexibility to ship arrangement and speeds of prime mover; furthermore, that they may be tied together electrically or separated, giving the effect of a clutch. Also the nature of the tie may be reversed so that propeller is reversed without stopping or reversing the prime mover. These are indeed great advantages.

Two general systems are used, direct current and alternating current. Direct current systems are used on limited capacities such as tugboats, fishing boats, Coast Guard cutters, ferries, small boats less than, say, about 1,000 H.P. per shaft. It is somewhat more flexible in control and application, easier to handle and maneuver, but more expensive per horsepower, and heavier, with possibly more maintenance on account of the brushes and commutator. Generator speeds are limited to 1[illegible]00 revolutions per minute in large sizes, hence require gear connections to steam turbines. Direct current is being used less and less aboard ship, being replaced by alternating current, both for main power and auxiliaries. Here again, however, the replacement cannot be complete. There will always be some direct current aboard every ship, and there will be ships with only direct current on them.

Alternating current systems for main power are used on large capacities, both naval and merchant marine. The A.C. generators can be operated at speeds of 3600 revolutions per minute in any size needed or, more particularly, can be operated at the best speed for the steam turbine. Also, power transmitted being the volts times the amperes times a suitable constant, it is necessary to increase the volts to limit the current to reasonable values. Thus standard applications use from 2300 volts to 5000 volts, much too high for marine direct current commutators.



Simplified connection diagram of main and field circuits of twin-screw, turbine-electric-drive ship with induction-type propulsion motors. The main units also furnish auxiliary power.

(1) The two main turbine-generator sets which furnish power to the propulsion motors. When operating at not less than two-thirds full speed, these main sets also furnish auxiliary a-c power.

(2) Generator cutout switches for connecting each main generator to its propulsion motor or for connecting one generator to drive both propulsion motors.

(3) Reverse contactors, operated by reverse levers at the control panel, serve to determine the direction of rotation of propulsion motors for ahead or astern propulsion.

(4) Motor-rotor resistance for use during starting operations and for reducing motor-speed below two-thirds full speed.

(5) Under normal conditions one of these contactor groups is closed and the main generator furnishes a-c. power to the motor of the dual-drive set, which, in turn, furnishes auxiliary d-c. power.

(6) DUAL-DRIVE SETS. When the speed of the main set goes below about two-thirds full speed, the speed of the dual-drive set is proportionally reduced and its turbine governor moves to a position that causes switches at (5) to open and at the same time admits steam to the turbine to drive the set. The a-c. machine then operates as a generator to furnish auxiliary a-c. power, and the d-c. machine continues to furnish auxiliary d-c. power.

To illustrate this point of the necessity of alternating current, with its possibility of voltage increase, note that 1000 amperes is a fairly heavy current, requiring large conductors of, say, 1 inch diameter copper or more. At 100 volts A.C., three phase, these 1000 amperes will deliver 220 H.P. to the shaft of the motor; at 1000 volts they will deliver 2200 H.P.; and at 5000 volts it would be 11,000 H.P., using three main conductors.

Using direct current at same efficiency and same amount of copper between generator and motor, on two wires, at 100 volts we would have 191 H.P. on shaft; and at 1000 volts, approximately the maximum practical, we would have 1910 H.P. at shaft.

For derivation of these relationships note the following:

1000 amps. x 100 volts x 1.73 ÷ 1000 = 173 KW.

1.73 is the 3 phase constant.

173 x 1.34 = 231.8 H.P.

1.34 is the H.P. to K.W. constant

Assume 5 per cent losses in motor

231.8 x .95 = 220 H.P. on shaft.

Power transmitted on 3 conductors each carrying 1000 amperes.

D.C. would require 2 conductors, and for same copper between generator and motor each would be half again larger and would carry 1500 amperes.

1500 amps. x 100 volts divided by 1000 = 150 K.W.

150 K.W. x 1.34 = 201 H.P.

.95 x 201 H.P. = 191 H.P. at 100 volts.
= 1910 H.P. at 1000 volts.

Compare this to the A.C. possibilities.

The A.C. drive is through either of two types of motor, the induction type or the synchronous type. The stators of both are practically the same. The differences are in the rotors. With the induction motor the rotor revolves at slightly less speed than would a similar synchronous motor, about 1 per cent less, which with other differences gives about 2 per cent less efficiency for the induction motor. It has many advantages, such as pole changing for naval vessels, easy and quick starting, operating at reduced speeds, less than 2/3 without bringing down the generator speed, thus allowing auxiliaries to be driven from main generator.

Besides being more efficient, the synchronous motor can be built lighter, and, using less current on account of unity power factor, a smaller generator can be used.

Motors of both types have been widely used, the induction type on all well-known battleships and airplane carriers, on self-unloading bulk freight carriers, car ferries and yachts. The synchronous motors have been applied on all modern passenger ships and Coast Guard cutters.

The accompanying diagrams illustrate the general schematic wiring arrangement for each type of motor.

Building Abroad?

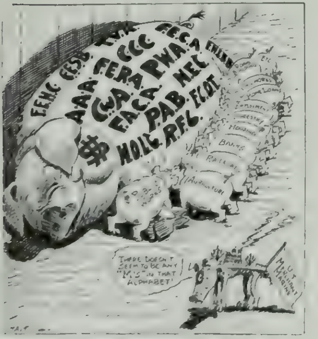
(Continued from Page 19)

tion. We must, therefore, build them ourselves.

"To force shipbuilding is to establish shipyards; is to form magazines; to multiply useful hands; to produce artists and workmen of every kind who may be found at once for peaceful speculation of commerce and for the terrible wants of war."

What do you think? It is up to you, me, all of us. We are the American nation. It is now our problem. What are you going to do with it?

The Runt!


F.E.H.C.
T.V.A.
F.E.C.A.
CCC
F.E.R.A.
P.W.A.
A.A.A.
C.W.A.
N.E.C.
F.A.C.A.
P.A.B.
H.O.L.C.
R.F.C.
$
Housing
Banks
Railroads
Agriculture
ETC.
THERE DOESN'T SEEM TO BE ANY "M's" IN THAT ALPHABET'
U.S. MERCHANT MARINE

Courtesy of Los Angeles Times

Engineers' Licenses

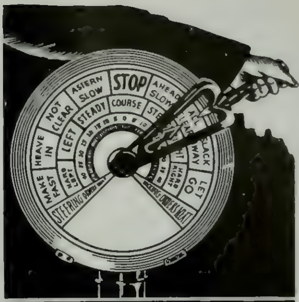
The following list shows the licenses granted during the month of March to engineer officers of the merchant marine at Pacific Coast offices of the Bureau of Marine Inspection and Navigation. For key to abbreviations see footnote.

Name and Grade	Class	Condition
HONOLULU		
Wallace A. H. Wochnick, 1st Asst. Eng.	OSS, any GT	RG
Wm. S. Kaehuaea, 3d Asst. Eng.	OSS, 4000 GT	O
Harold A. McLaskey, 3d Asst. Eng.	OSS, any GT	O
Clarence V. McIntosh, 2nd Asst. Eng.	OSS, any GT	RG
JUNEAU		
Robert M. Becker, 1st Asst. Eng.	OSS, any GT	RG
Edwin Ellingsen, 2nd Asst. Eng.	OSS, any GT	O
John B. Klapperich, 1st Asst. Eng.	OSS, any GT	RG
William W. Whitcher, Chief Eng.	OSS, 1000 GT	RG
2nd Asst. Eng.	OSS, any GT	
Frank V. Schultz, 2nd Asst. Eng.	OMS, any GT	O
PORTLAND		
Jack D. McGee, Chief Eng.	OSS & OMS, 750 GT	O
2nd Asst. Eng.	OSS & OMS, any GT	O
Leo V. Butterfield, Chief Eng.	OMS, 300 GT	O
3rd Asst. Eng.	OMS, 1000 GT	
Loren E. McRae, Chief Eng.	OMS, 300 GT	O
1st Asst. Eng.	OMS, 450 GT	
Wesley Vantzelfden, Chief Eng.	OMS, 300 GT	O
1st Asst. Eng.	OMS, 450 GT	
John L. Montgomery, 1st Asst. Eng.	OSS, any GT	RG
Allen L. Hendrickson, 2nd Asst. Eng.	OSS, any GT	RG
Albert H. Hayes, 3d Asst. Eng.	OSS, any GT	O
SAN PEDRO		
Frode Andersen, 2nd Asst. Eng.	OSS, any GT	O
Donald A. Lambert, 3d Asst. Eng.	OSS, any GT	O
Clarence L. Davidson, 3d Asst. Eng.	OSS, any GT	O
John Thomassen, 2nd Asst. Eng.	OSS, any GT	O
SAN FRANCISCO		
John J. Holland, Chief Eng.	OSS, any GT	RG
Elmer L. Ford, Chief Eng.	OSS, any GT	RG
Eugene W. Winter, Chief Eng.	OSS, any GT	RG
Larry G. Mayo, Chief Eng.	OSS, any GT	RG
Colum W. Lowith, Chief Eng.	OSS, any GT	RG
John F. Hanratan, Chief Eng.	OSS, any GT	RG
John R. O'Neil, 1st Asst. Eng.	OSS, any GT	RG
Lawrence A. Phifer, 1st Asst. Eng.	OSS, any GT	RG
John C. Merriman, 1st Asst. Eng.	OSS, any GT	RG
Bert L. Hale, 1st Asst. Eng.	OSS, any GT	RG
Harold M. Gammelgaard, 1st Asst. Eng.	OSS, any GT	RG
Alvin G. Hutto, 1st Asst. Eng.	OSS, any GT	RG
Alfred J. Alexander, 2nd Asst. Eng.	OSS, any GT	O
Kenneth G. S. Robertson, 2nd Asst. Eng.	OSS, any GT	RG
Ray J. Sauer, 2nd Asst. Eng.	OSS, any GT	RG
George W. Simmons, Jr., 3d Asst. Eng.	OSS & OMS, any GT	O
John A. Katsos, 3d Asst. Eng.	OSS, any GT	O
Frank G. Dorego, 3d Asst. Eng.	OSS, any GT	O
Frank A. Micheli, 3d Asst. Eng.	OSS, any GT	O
John P. Dennin, 3d Asst. Eng.	OSS, any GT	O
Lewis S. McClure, 3d Asst. Eng.	OSS, any GT	O
George K. Wong, Chief Eng.	OMS, any GT	O
Frederick E. Newman, Chief Eng.	OMS, any GT	O
Arthur C. Lewis, Chief Eng.	OMS, any GT	O
SEATTLE		
Charles L. Gearhart, Chief Eng.	OMS, any GT	O
Erin M. Kirk, Chief Eng.	OMS, any GT	O
Henry W. Mohr, Chief Eng.	OMS, any GT	O
Joseph W. Eaton, 3rd Asst. Eng.	OSS, any GT	O

Abbreviations: GT is gross tonnage; RG is raised grade; O is original license; OSS is ocean steamer; OMS is ocean motorship.

Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A DEPARTMENT FOR DECK OFFICERS

The Bureau of Navigation

Frederick K. Arzt, *LL.B.*

Senior Administrative Assistant

At a very early date in the history f the United States, Congress en- red upon the work of regulating e merchant marine. In fact, the cognized need of uniform regula- on of navigation and shipping was e of the potent reasons for the rmation of a more perfect union the States. The third act of the irst Congress, approved July 20, 89 (1 Stat. 27), imposed a duty on e tonnage of vessels. This was fol- wed on September 1, 1789 (1 Stat.), by an act providing for the reg- tering and clearing of vessels and e regulation of the coastwise trade, hich is still the foundation of the avigation laws and until 1912 em- odied the marine policy of the nited States. Succeeding Con- esses have built upon this founda- n a system of laws designed to eet the growth and variety of con- tions of our water-borne commerce, th increasing regard in the course years for the safety of human life.

Prior to 1872, the duty of adminis- ring the laws regulating naviga- n was entrusted to the circuit urts, the collectors and surveyors customs, the Register of the Trea- ry, and certain other officers of e Treasury Department. In 1872, a ginning was made toward the cre- ion of a special service for the en- rcement of the navigation laws rough the passage of the act of June 7, 1872 (17 Stat. 262), providing for the appointment of shipping commissioners at the more important ports of the country. These officers, whose duties were modeled after those of the mercantile marine officers of Great Britain and somewhat similar officers in Germany, France, and other countries, were to administer those portions of the navigation laws having to do with the shipping, discharge, and care of seamen on American merchant vessels. Their specific duties, as defined in the act were: (1) To afford facilities for engaging seamen by keeping a register of their names and characters; (2) to superintend their engagements and discharge; (3) to provide means for the securing on board at the proper time of men so engaged; (4) to facilitate the making of apprenticeships to the sea service; (5) and to hear and decide questions which masters and men mutally agreed to submit to them.

The act authorized the judges of the circuit courts, in whose circuits there were collection districts at ports of entry, to appoint such officers at their discretion, the judges to exercise the power of removal, supervision, and control over shipping commissioners thus appointed. These officers were given no salary, the law providing that they should be compensated by the payment to them by owners of vessels, of fees for shipping and discharging seamen. Clerical service and suitable quarters were to be provided by the shipping commissioners at their own expense.

Collectors or deputy collectors of customs were authorized to perform the duties of shipping commissioners in ports where the amount of work required did not justify the appointment of such officers. The passage of this act relieved the circuit courts of a large amount of work in connection with the shipment of seamen and the adjudication of petty controversies between masters and men.

The act of June 26, 1884 (23 Stat. 53), further relieved the circuit courts of duties in respect to these laws by providing that, thereafter the shipping commissioners should be appointed by the Secretary of the Treasury, who was given full supervision and control over the work of these officers. The fees were required to be paid into the Treasury of the United States, to constitute a fund to be used under the direction of the Secretary of the Treasury to pay the compensation of the commissioners and their clerks, determined by the Secretary, and such other expenses as he may deem necessary to insure the proper administration of their duties.

The act of July 5, 1884 (23 Stat. 118), created a special service known as the Bureau of Navigation under the Treasury Department, with the duty of supervising the work having to do with the administration of the navigation laws. The purpose of the act was to concentrate responsibility for the enforcement of these laws in a distinct service. The act, among other things, specifically allotted to the Bureau the decision of questions relating to the merchant marine and merchant seamen from the office of the Secretary of the Treasury; the supervision of shipping commissioners' offices and employees; the shipment and discharge of seamen; and other matters under the general clause giving the Commissioners of Navigation general jurisdiction over the commercial marine and merchant seamen of the United States. This consolidation of Government supervision of the merchant marine in one Bureau checked much duplication of work and gave an opportunity to abolish various illegal exactions and practices in shipping offices which had not been brought to the executive attention of the courts.

By the act of June 19, 1886 (24 Stat. 79), the payment of fees by the owners of vessels for the services of shipping commissioners was abolished. The work of the shipping commissioners with respect to the shipment and discharge of seamen, which had hitherto been confined to vessels engaged in the foreign trade was extended to include any vessel engaged in the coastwise trade or trade between the United States and Canada, or Newfoundland, or the West Indies, or Mexico, upon the request of the master or owner of such vessel.

A sweeping revision of the law with respect to governmental supervision over the shipping and discharge of merchant seamen, accomplished by the passage of the act of December 21, 1898 (30 Stat. 755), added greatly to the duties of shipping commissioners. This act was the first application made by any Government of the provisions of common law, relating to civil contracts for labor, to the agreements between seamen and masters or owners. The essential portion of the act gave to seamen the right to quit in the domestic or nearly foreign trade, subject to no penalties of consequence except liability to suit for breach of contract. The Commissioner of Navigation, in commenting in his annual report of 1899 on the work of shipping commissioner, said:

"There is an increasing tendency on the part of owners, masters, and seamen to refer to the arbitration of the commissioners those disputes which seem inseparable from labor at sea. The settlement of such disputes is one of the useful functions of the commissioners, and appeal to them should, in the great majority of cases, render unnecessary expensive litigation."

By an act approved February 4, 1903 (32 Stat. 825, 826), the Bureau of Navigation and all jurisdiction in respect to the enforcement of the navigation laws, was transferred to the newly created Department of Commerce and Labor. The transfer of the Bureau to the new Department necessarily was attended with some embarrassments, especially with respect to questions of jurisdiction over certain matters affecting two or more Bureaus or Departments. In reply to a query as to which Department had jurisdiction over shipping, the Attorney General in an opinion dated August 13, 1903 (25 Op. Atty. Gen. 29), held:

"The general line of cleavage established by the act creating your department between it and the Treasury Department leaves 'Navigation' with you and little with the Treasury Department, which does not concern the collection, keeping, minting, and disbursing of the public treasure. In case of doubt, we are accordingly justified in saying that a matter which belongs to navigation as this does, has been transferred to you."

Nevertheless, in those ports in which no shipping commissioner has been appointed, the duties of that office are performed by the collector or deputy collector of customs at that port, who by the provisions of section 4503 shall for all purposes be deemed a shipping commissioner with all the rights, duties, and obligations of that office appertaining.

By the provisions of the act of June 30, 1932, section 501, the Secretary of Commerce was authorized and directed to consolidate and coordinate the Steamboat Inspection Service and the Bureau of Navigation in a Bureau in such Department to be known as Bureau of Navigation and Steamboat Inspection.

The offices of Supervising Inspector General and Commissioner of Navigation were eliminated, and a Director of the Bureau of Marine Inspection and Navigation was appointed. An Assistant Director in charge of Marine Inspection and all matters pertaining thereto, and an Assistant Director in charge of the navigation section, were appointed All the work formerly performed by the Bureau of Navigation was continued under the leadership of the duly appointed Assistant Director.

The name of the Bureau of Navigation and Steamboat Inspection was changed by the act of May 27 1936 (49 Stat. 1380), to Bureau of Marine Inspection and Navigation.

The scope of the duties of the navigation section of the Bureau was considerably widened during the latter part of 1937 when by a reallocation of duties the administration an supervision of the A, B, and C Investigation Boards were brought within the administrative jurisdiction of th Assistant Director in charge of th navigation section.

[Bulletin, Bureau of Marine Inspection and N. vigation

Relief on All Fools' Day

San Francisco, April 1, 1938
Editor, Pacific Marine Review.
Dear Sir:

Here is one in the "lighter vein' for the benefit of the company of ol time wind jammer men who labo along California street trying t make ship sense out of steame accounts.

Hast ever been sailing
  Upon the wide ocean
When loud the wind blustered
  And hissing the waves ran—

Hast wrought at the wheels rim
  With muscles aquiver
While reeling the ship fled
  Her deck a wild river—

Hast gone to the masthead
  When halliards need clearing
And soared like a sea gull
  In mid air careering—

Or rode on the bowsprit
  The reaching waves cheating
Low skimmed like a petrel
  The hollow crests leaping—

The plague take my ledger
  A murrain the balance—
What kens the ships husband
  Of sailing or romance.

That's Well—Belay—
W. M. Holling

Vacation Plans for Seamen

In line with intelligent treatment employee relationships is the an- ouncement by the Matson Naviga- on Company of vacations for both ensed and unlicensed seagoing rsonnel.

The first announcement, effective nuary 1, 1938, includes masters, ief officers, other licensed deck of- ers, chief engineers, assistant ief engineers, other licensed engin- r officers, pursers, assistant pur- s, accounting and clerical assis- nts, chief stewards, second stew- ds, cabin class stewards, head chef, ief surgeons, and radio operators.

Vacation of two weeks with pay, the then salary rate, will be given all who have served a year con- uously.

The second announcement, effec- e March 1, 1938, includes all sea- ing personnel not included in the st announcement. To these a vaca- n of one week with pay is granted completion of one year continu- s service. After the second and ch succeeding year of service they e entitled to two weeks' vacation th pay.

The published rules governing va- tion conditions are very generous. any person's employment is termi- ted through no fault of his own ter he has served six months but fore his year is finished, that per- n is entitled to a pro rata on his cation pay. Vacation pay may be awn in advance.

Vacations, as far as possible, will scheduled to suit employees, and far as possible will begin when ip is at a United States mainland rt.

Says William P. Roth, president of tson Navigation Company:

"The value of regular periods of axation is well recognized, and the rpose of these provisions is to vide the widest possible oppor- nity for such periods. The person- l is invited to discuss arrange- nts freely with department heads, that every cooperation consistent th operating conditions may be ex- nded, and every vacation enjoyed."

Deck Officers' Licenses

The following list shows the licenses granted during the month of March to deck officers of the merchant marine at Pacific Coast offices of the Bureau of Marine Inspection and Navigation. For key to abbreviations see footnote.

Name and Grade	Class	Condition
HONOLULU		
Leonard Kenneth Hail, 3d Mate	OSS & OMS, any GT	O
JUNEAU		
Louis J. Glatz, Chief Mate	OSS & OMS, any GT	RG
PORTLAND		
David C. Crosby, 2nd Mate	OSS & OMS, any GT	RG
Francis D. Grant, 2nd Mate	OSS & OMS, any GT	RG
Harold H. Wolfe, 2nd Class Pilot		O
SAN PEDRO		
William C. Ball, Master and Pilot	OSS, any GT	RG
Gudmund J. Grimstad, Master	OS Yachts, any GT	O
Robert A. Lyon, 3d Mate	OSS, any GT	O
SAN FRANCISCO		
John P. McPherson, Master	OSS, any GT	RG
Perry T. Pedersen, Chief Mate	OSS, any GT	RG
Karl J. Staus, Chief Mate	OSS, any GT	RG
Edward M. Brown, Chief Mate	OSS, any GT	RG
Arthur O. Bragg, Chief Mate	OSS, any GT	RG
Philo E. Davis, 2nd Mate	OSS, any GT	O
Harry N. Petersen, 2nd Mate	OSS, any GT	O
David L. Banks, 2nd Mate	OSS, any GT	RG
John J. Sandbote, Jr., 2nd Mate	OSS, any GT	RG
Nils E. Hasselberg, 2nd Mate	OSS, any GT	O
Emil K. Solevaag, 2nd Mate	OSS, any GT	O
Francis E. Wilson, 3d Mate	OSS, any GT	O
Frithjof L. Torstenson, 3d Mate	OSS, any GT	O
George W. Jahn, 3rd Mate	OSS, any GT	O
Frederick Miles Felton, 3d Mate	OSS, any GT	O
James H. Ellis, 1st Class Pilot	OMS, any GT	O
SEATTLE		
Percy C. Arms, Chief Mate	OSS, any GT	RG
Ellis A. Folmar, Chief Mate	OSS, any GT	RG
Arthur W. Howgate, Chief Mate	OSS, any GT	RG
Edgar E. Mulligan, Chief Mate	OSS, any GT	RG
Edward J. Burke, 2nd Mate	OSS, any GT	RG
John F. Hender, 2nd Mate	OSS, any GT	RG
J. Fletcher Ruttle, 2nd Mate	OSS, any GT	RG
Thomas W. Bartlett, 3d Mate	OSS, any GT	O
Harold L. Kildall, 3d Mate	OSS, any GT	O
Joseph M. Kildall, 3d Mate	OSS, any GT	O
Chris Nilsen, 3d Mate	OSS, any GT	O

Abbreviations: GT is gross tonnage; RG is raised grade; O is original license; OSS is ocean steamer; OMS is ocean motorship.

Change of Masters

Steamer Point Salinas: A C. Nielsen; vice, E. Warnell.
Steamer D. G. Scofield: A. H. Koskin; vice, G. C. Johannson.
Steamer Catherine G. Sudden: G. A. Johnson; vice, J. R. Granman.
Steamer Kailua: C. W. Saunders; vice, Frank Johnson.
Steamer F. H. Hillman: G. A. Johnson; vice, J. S. Christenson.
Steamer Floridian: W. F. M. Scorah; vice, F. Murphy.
Steamer Columbian: O. Lee; vice, W. I. Stevens.
Steamer General M. H. Sherman: C. N. Olson; vice, F. A. Johnson
Steamer Maunawili: H. A. Gillespie; vice, M. V. Bulger.
Steamer F. H. Hillman: J. S. Christenson; vice, G. A. Johnson.
Steamer Ewa: E. F. Lono; vice, F. A. Johnson.
Steamer Mexican: C. H. Brunn; vice, H. A. Oliver.
Steamer Golden Cross: O. Bergman; vice, F. E. Trask.
Steamer Paul Shoup: G. A. Moerman; vice, L. E. Hawkins.
Steamer President Harrison: H. J. Ehman; vice, O. E. Collins.

Captain Everett Van Pray of S. S. J. W. Van Dyke receiving the merchant marine naval auxiliary flag from Capt. W. L. Beck, Chief of Staff, 4th Naval District.

J. W. Van Dyke

World's Largest Highest Steam

A Vessel That is Different in Many Details

On the evening of February 24 the J. W. Van Dyke, new 18,500 ton tanker, returned to Chester, Pa., after an eminently satisfactory performance on her builder's acceptance trials.

This vessel was designed by the technical staff of the marine department of the Atlantic Refining Company and built by the Sun Shipbuilding and Dry Dock Company.

Her principal characteristics are:

Length overall	543 feet
Beam molded	70 feet
Depth	40 feet
Total deadweight cap.	18,500 tons
Cargo capacity	156,000 barrels
Fuel bunker capacity	9,070 barrels
Horsepower	5,000
Propeller speed	90 rev.
Sea speed loaded	13.25 knots

She is built on the Isherwood "Bracketless" system of hull framing, and in way of her cargo tanks all hull joints, including deck and shell plating, are completely welded. Hers is the largest hull to be so completely all welded in the history of steel shipbuilding. The Sun Shipbuilding and Dry Dock Company has developed the technique of ship welding procedure to a remarkable degree and is ready on any hull to go to the limit of welding now allowed by the classification societies.

In addition to being the world's largest welded ship, the J. W. Van Dyke embodies a number of entirely new features in the application of modern engineering principles to marine construction, and is expected to set a record of unusually low fuel consumption. The first American-built turbo-electric tanker, the vessel is the fifteenth electrically propelled ship designed by Atlantic engineers during the past fifteen years, making Atlantic the owner and operator of more electrically propelled vessels than any other company in the world.

Many of the engineering principles involved in the design of the new tanker are taken from the best land practice developments of recent years that after careful study have appeared applicable to marine equipment. For the first time standard voltage and frequency have been applied to the main propulsion turbo-generator, which is a 3 phase, 60 cycle machine, operating at 2300 volts and supplying its power through a synchronous propelling motor, developing 5000 HP at the synchronous speed of 90 r.p.m. For the first time in the United States, 650-pound steam pressure is to be employed, at a temperature of 835° F. While this may seem high for marine installation, it is low when compared to the many land installations of 1500-pound pressure at 900° F. temperature.

Steam for the propulsion power plant for this vessel is generated in two cross drum header type Babcock and Wilcox water tube boilers at 650 pounds pressure and at a temperature of 835° Fahrenheit. Air preheaters are employed and the boilers are fitted with fully automatic combustion and superheater control the Bailey type, here used for th first time aboard ship.

Since the main turbo generati set is mounted on the same twee decks as the boilers, it is possible shorten the main steam pipe to le than 20 feet. The main turbine a General Electric unit rated 60 horsepower at 3600 r.p.m. and direc ly connected to a General Electr 4530 K.V.A., 2300 volt, 60 cycle, phase alternating current generat This generator supplies current a General Electric 2300 volt sy chronous induction motor direct connected to the propeller shaft a rated 5000 shaft horsepower at r.p.m.

The main turbine exhaust flanged directly to the top of t condenser casing. This condenser of the twin type, with separate wat boxes and divided hot well, and supported on specially design spring mounted feet. This constru tion makes it possible to shut do either side of the condenser in ca of emergency. Circulating water this condenser is supplied by Wor ington centrifugal pumps.

Ingersoll Rand also supplied auxiliary condensers, the three c densate pumps, and the three f pumps. These latter are turb drive multi-stage centrifugal pun of the Cameron type, automatica controlled in speed by pressure giving automatic feed water regu tion through connection to and int connection with the combustion c trol system.

All Welded and Pressure Tanker

Night view of the deck

Feed water is heated in three stages by Griscom Russel heaters, and enters the boiler at a temperature of 350° F.

A novel feature of the propulsion motor is the main thrust bearing, which is of the roller type, both on journal and thrust surfaces, and was supplied by Messinger Bearings Inc.

For fire protection the main generator, located in the turbine flat, and the main motor, located in the engine room, are covered by a C-O-Two system consisting of seven 50lb. cylinders. This system may be operated from either of two control stations, one of which is located in the engine room and the other on the upper deck. At each station there are two ¾ inch direction valves to provide a rapid initial discharge of the gas to the main motor and to the main generator. Similarly for delayed discharge to each of these spaces there are two ½ inch direction valves at each control station.

C-O-Two systems employ carbon dioxide, the fastest extinguishing agent known. They have been installed on a wide variety of vessels, due not only to their speedy extinguishing efficiency, but also because of their non-damaging effect.

Two General Electric turbo-generator sets, each rated 350 K.W. and 450 volts, supply current for the áuxiliary machinery and for lighting. These units are mounted on the tween decks as are also the switchboard and all the control equipment for the auxiliary motors.

This arrangement of the engine room permits more space around the various units and greatly simplifies the piping layout as compared with most steam tankers. It is the universal testimony of visitors that this is a beautiful engine room.

All of the machinery is either white enamel or chromium-plated and the ladder railings are made of stainless steel. The electrical panel which extends the full width of the engine room is of black bakelite finish.

Illumination is by a special type of diffused flood lighting fixtures

which give bright light all over the entire installation.

The engine room auxiliaries are unusual, inasmuch as they are all, with the exception of the feed pumps, operated by alternating current. All motors are of explosion-proof type and, of course, are totally enclosed; in fact, all motors aboard this vessel are totally enclosed. All underdeck auxiliary motors are of 440 volts, and this is also true of the two auxiliary turbo-generator sets. A novel feature of the operation at sea is shown in the operation of the auxiliaries when running at a propeller speed of 90 r.p.m. All auxiliary power is taken from the main turbo-generator, the 2300 volts being transformed to 440 volts in the engine room by specially designed transformers.

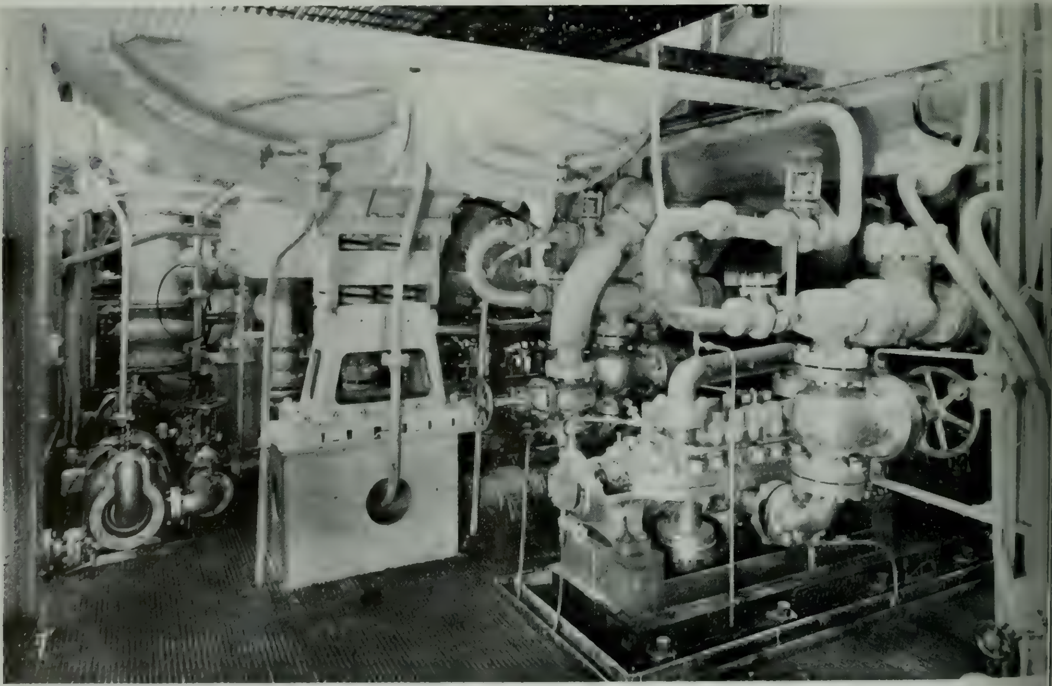
When the vessel maneuvers, or in other words when the propeller speed drops below 85 r.p.m., the 440 volts required for auxiliary power is taken directly and automatically from the auxiliary turbo-generator, but when synchronous speed, or 90 r.p.m. is reached, the generator of the auxiliary set automatically becomes a synchronous motor and the auxiliary sets then run as exciters only, for the main turbo-generator. Therefore, all of the power, both main and auxiliary, is produced by the main turbo-generator, with the resultant economy of the main turbine.

This actually means that when this vessel is at sea there will be but 20 feet of steam pipe carrying the 650-pound, 835° steam. Thus it is shown how it is possible to pioneer in high pressure and temperature, and yet actually accomplish it conservatively.

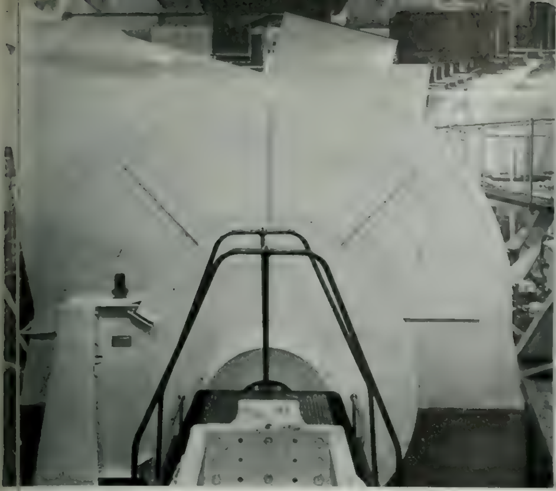
The steering of the J. W. Van Dyke is accomplished by electro-hydraulic steering gear, using two complete motor-driven hydraulic pumps, and two complete Sperry Gyro-Pilot after units. There are three distinct methods of controlling this steering gear from the bridge, namely: (1) through the gyro-pilot actuated by the gyro-compass; (2) through the same mechanism controlled by the hand trick wheel; and (3) by an entirely independent lever control, which applies current directly to th auxiliary after unit, without interconnection through any parts of the gyro system. So long as there is current aboard the ship, which is necessary to run the steering gear, it ca be controlled by any of the thre methods described above.

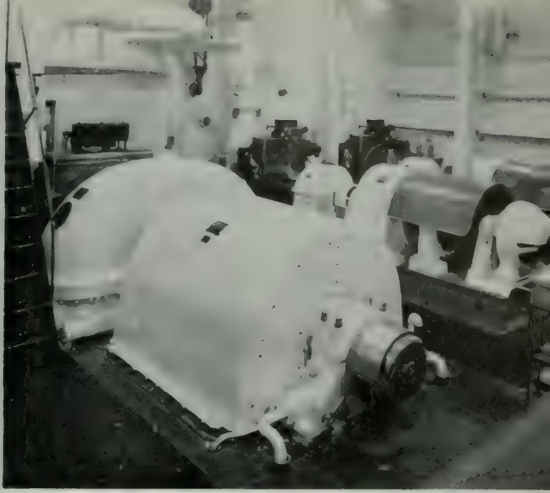
In connection with the deck machinery, which was all built b Lidgerwood, there have been severa departures from the usual practice In the first place all deck machinery which consists of one windlass, tw deck winches and three capstans, a of cast steel, no cast iron whatsoever having been employed. Th windlass is novel, inasmuch as it i a complete electric hydraulic windlass. Under deck in the forecastl is located the motor-driven hydraulic pump, and on deck, directly connected to the windlass, is the hydraulic motor.

By this method perfect control i obtained on the windlass, the moto of the hydraulic pump always running at constant speed. The contro is effected by means of hydrauli variation, and it is possible to mov



The lower side of condenser, showing spring support, the main feed pump and other pumps.



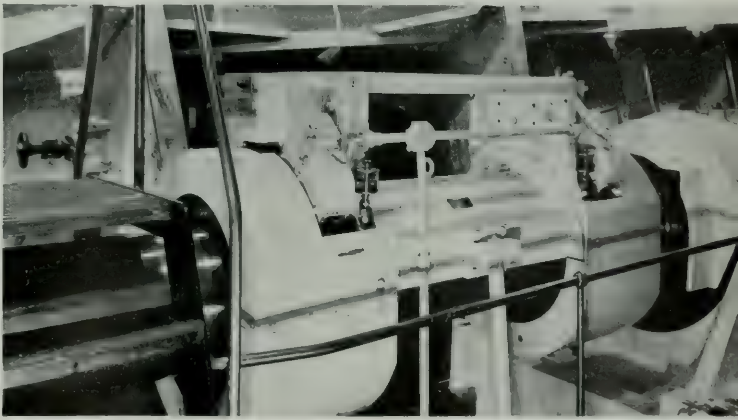


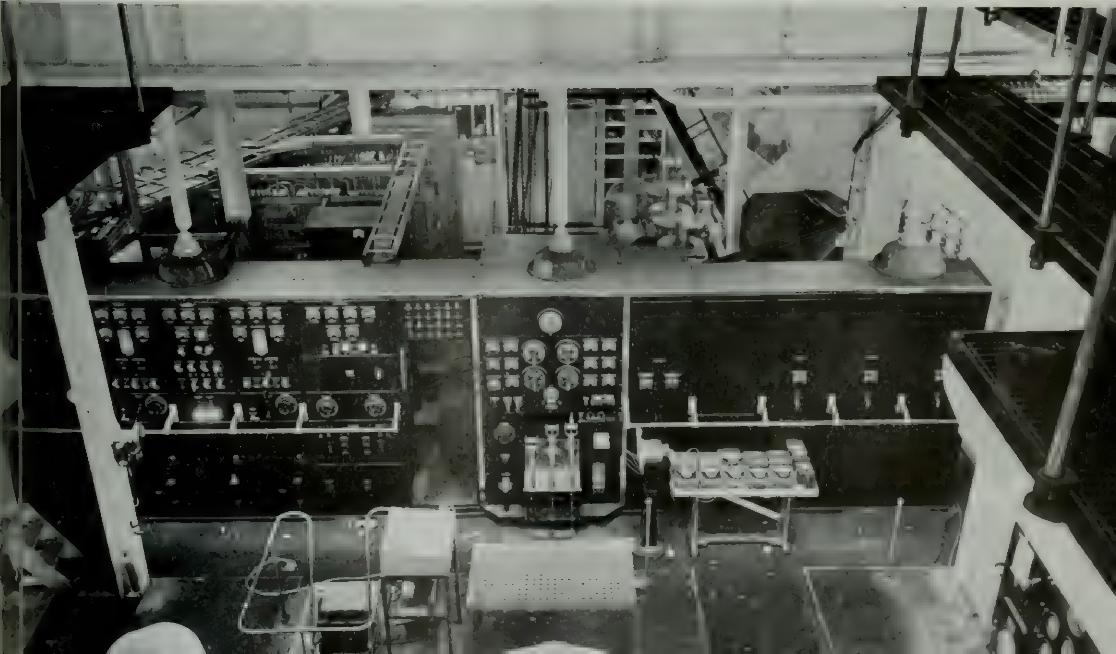
Top, left: Main propulsion motor.

Top, right: The generator flat, with main propulsion generator in foreground.

Center: The tailshaft, with main thrust bearing and torque meter.

Bottom: A view of interior of engine room, featuring switchboard, and, in foreground, the after end of propulsion generator.

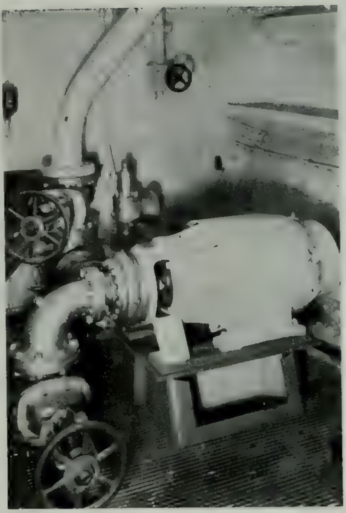




the windlass so slowly that the movement is almost imperceptible to the eye. In addition, the relief valve on the hydraulic motor overcomes the danger of damage to the windlass by inertia forces, an inherent difficulty encountered in direct electric drive installations.

A very distinct departure has been made in connection with the cargo pumps. There has been much study, attended by considerable accomplishment, in recent years with regard to the rapid "turn around" of tankers. Based on these studies, it was the management's charge to the engineering and construction department that the cargo pumps be capable of discharging 15,000 barrels per hour. After thorough investigation it was decided to install centrifugal pumps of the vertical type, sometimes known as the deep-well type, with vertical explosion-proof motors, which are located on deck. The pumps chosen were of Worthington manufacture.

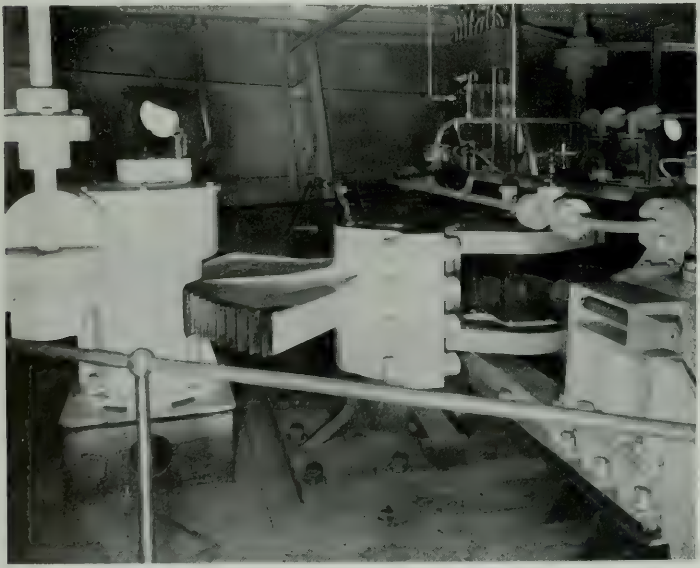
This not only makes possible a very simple pump room located amidship, but results in a feature never before seen in any cargo pump room; namely, the entire pump room is without wires or lights, and is illuminated by totally-enclosed floodlights behind glass set in the deck. In the pump room, moreover, there are absolutely no stuffing boxes of any kind on the pumps. The column that carries the shafting also carries the discharge liquid, and this greatly simplifies the pump room piping.


The fire and Butterworth System pump.

The priming of the pumps under all conditions is accomplished by a special vacuum system employing three Hytor vacuum pumps, a system which has been used successfully by The Atlantic Refining Compan for ten years. The control of th cargo pumps is accomplished b means of explosion-proof "start" an "stop" buttons. The speed is regulated directly from the engine roon

The vessel is, of course, equippe with the very latest in radio equi ment, and a radio direction finde was furnished by the Radio Marin Corporation.

A sister ship, identical with th J. W. Van Dyke in every particula is under construction at the Su Shipbuilding & Dry Dock Company.


The electro-hydraulic steering gear.

World's Radio Beacons

During the past calendar yea there has been a substantial increas in the number of radiobeacons avai able for marine navigation in a parts of the world.

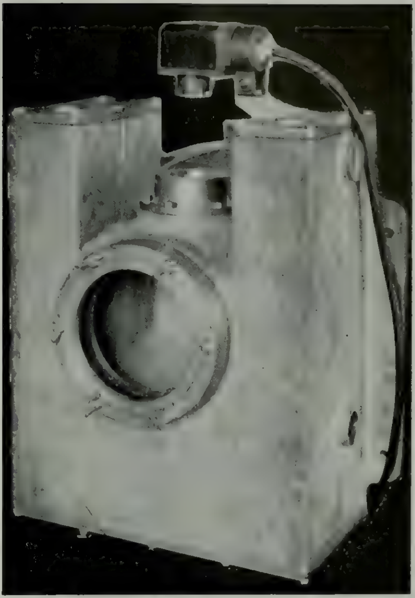
These navigational signals, whic were largely pioneered by the Unite States Lighthouse Service, hav found such universal acceptance th they are now provided by all the im portant maritime nations of th world.

The total number of marine radi beacons in the world on January 1937, was approximately 380, which the United States had appro imately 33 per cent. Similar figur for January 1, 1938, show the tot for the world to be approximate 421, with the United States having per cent. The world increase duri the past year was 11 per cent, whi the increase in United States radi beacons was 4 per cent. The low rate of increase in the United Stat is due to the fact that its radiobe con system had already reached state of practically full developme insofar as major stations are co cerned. The United States Ligh house Service is now expending co siderable effort in improving the fectiveness of its radiobeacons the addition of distance-finding si nals, consisting of the synchroniz tion of the radiobeacon signals a the sound-in-air fog signals, su signals now being available at stations, and the equipment of st tions is being rapidly moderniz for improved service.

[U. S. Lighthouse Service Bulletin.]

The *Short Oil Detector*

for Marine and Stationary Boilers Offers Protection Against Oil Contamination



Today, when marine power plants are using higher pressures and temperatures and squeezing every possible B.T.U. out of every pound of fuel oil, and the oil refineries are cracking every possible ounce of distillates out of petroleum and selling the residues for boiler fuel, it becomes increasingly necessary to put more and more pressure on fuel oil heaters due to heaters plugging up on this type of fuel oil, with consequent increased hazard due to fuel oil heaters carrying away.

These steam conditions on shipboard lead to a very rapid turn-over of the water-steam cycle, and to a greater strain on the coils of the fuel oil heaters. The slightest leak of oil from the heaters into the steam line finds its way to the hot well and becomes a menace to marine boilers. The slightest film of oil on the furnaces of fire tube boilers has caused the furnaces to drop, thereby creating great damage in the boiler and expensive repairs plus loss of ship's time. Films of oil on the inner surfaces of the tubes of water tube boilers cause burnt out and sagging tubes, with consequent expensive delay and retubing.

To guard against this economic [illegible], Thomas A. Short, marine engineer of San Francisco, has designed an ingenious device called the Short Oil Detector, which detects the presence of oil bubbles in the drain from the fuel oil heaters, gives an alarm, and/or automatically cuts off the drain from delivery to the hot well and diverts it to the bilges.

As shown in the illustration, this device consists of a cast bronze chest in the front of which is a circular glass window and on top of which is a small circular glass port. At the bottom of this chest a chamber is arranged in which is installed at the center an incandescent lamp. Directly above this lamp, and in line with the glass port in the top of the chest, is a similar glass port in the top of the bottom chamber. Above the upper glass port on the top of the chest is mounted a photo-electric cell manufactured by the General Electric Company. The chest is so arranged internally that when filled with water it automatically ejects all air bubbles.

On board ship this Oil Detector would be connected in the drain line between the oil heater and the feed and filter tank. When the steam condensate from the fuel heater enters the detector, any oil bubbles contained in this steam are sure to rise to the upper glass port, or, if the oil is heavier than water, it will drop to the bottom glass. Immediately when the oil bubble strikes either glass there is an interruption of the flow of light and the photo-electric cell acts on a relay to energize an alarm.

This alarm may be either audible or visual or both. If it is deemed desirable to make the Oil Detector fully automatic, the relay may, of course, be connected up to energize a solenoid operated valve which would immediately divert the drain from the fuel heaters to the ship's bilges and prevent any contamination of the feed water.

The Short Oil Detector has been in test operation for over two years on the steamship Chirikof of the Alaska Packers Association, where its performance has been very satisfactory. The wrinkles have all been ironed out and the device is ready for production.

An interesting item in the Oil Detector construction is the use of Tufflex tempered plate glass, which insures against breakage from all ordinary impact or from sudden changes in temperature.

This device installed on shipboard is an insurance against the damage which comes from oil in feed water and which is an increasing menace with modern boiler fuels in modern steam plants.

The Short Oil Detector is manufactured and distributed by the Thomas A. Short Co., No. 1 Drumm St., San Francisco, Calif.

Ocean Tug Sea Giant

Largest and Most Powerful on Pacific Coast

The Shipowners and Merchants Tug Boat Company Limited has recently added to its fleet of tugs a sturdy steel vessel, the Sea Giant, which is claimed to be the largest and most powerful commercial tug on the Pacific Coast.

This vessel was purchased from the U. S. Navy. Her hull and power plant were given a thorough overhaul at the yard of The Pacific Dry Dock and Repair Company of Oakland, California, and considerable new equipment was installed.

Built at the Staten Island Shipbuilding Company, New York, in 1920, and christened Contocook, she has the following characteristics:

Length overall	156 feet 8 inches
Length B. P.	149 feet 3¾ inches
Length on load water line	143 feet 9 inches
Beam on load water line	31 feet 4 inches
Draft aft full load	15 feet 1½ inches
Speed designed	13 knots
Capacity fuel oil tanks	2,067 bbls.
Cruising radius at 10 knots	4,500 miles
Cruising radius full speed	3,000 miles
Displacement	1,000 tons
Gross measurement	502 tons
Propulsion power	1800 I.H.P.
Propeller speed	100 r.p.m.

She is of the single screw, single deck type built entirely of steel. Being intended for heavy sea towing and mine sweeping, the hull is of heavy construction and is fitted with eight transverse water tight bulkheads, six of which extend to the main deck and two to platform deck.

A steel deck house provides: accommodations for the crew; the galley and galley stores; officers' and crew's washrooms; and officers' and crew's mess roms. On top of this deck house a steel superstructure encloses pilot house, officers' staterooms, and radio room.

Tug Sea Giant with San Francisco-Oakland Bridge in background.

Two steel masts are fitted. The foremast carries a crow's nest and the mainmast is fitted with two steel booms each tested for three-ton working loads.

Fuel oil is carried in thwartship tanks from frame 20 to frame 34 and extending from the keel to the main deck. The total capacity of these tanks is 86,802 gallons or 2,067 barrels.

Capacity for 4,800 gallons of reserve feed water is provided in the double bottom under the engine room.

Machinery

The propulsion machinery consists of two single end oil burning Scotch marine boilers supplying steam to one triple expansion steam engine direct connected to a single right handed screw propeller.

The boilers are set one port and one starboard with the axis of tl shell fore and aft. They have a wor ing pressure of 185 lbs. and are test to 277 pounds. The inside diamet is 13 feet 3 inches, and the lengt 11 feet 2 inches. Each boiler has furnaces of the Morrison type. Ea boiler has a heating surface of 2,4 square feet.

The main steam pipe is of seamle drawn steel. All other steam pipi is of copper. Exhaust pipes are g vanized iron.

One of the principal improvemer installed by the new owners is t new oil burning system for th boilers. After a thorough vestigation they chose the lat type Ray Rotary Oil Burner w steam turbine drive and automa steam pressure control. These bu ers have the new form of fan a fan housing which produces a u form and constant pressure flow mbustion air and greatly improves e efficiency of the fan and the onomy of combustion. This burner s a mushroom head type of nozzle, hich sprays the oil evenly in a com- ete circle directly into the whirling ream of air and gives practically rfect atomization of the fuel.

The main engine is a vertical 3 linder triple expansion unit with ilt in condenser. It has a stroke 42 inches and piston diameters of inches in the high pressure, 33.5 ches in the intermediate pressure, d 55.5 inches in the low pressure linders. It is fitted with: Stephen- n link valve gear; a steam actu- ed reverse lever equipped with dif- rential motion; and cut off inde- ndently adjustable for each cylin- r. All cylinder valves are of the ston type.

The crank shaft and thrust shaft e each 11½ inch diameter solid eel and the propeller shaft 11⅝ ch diameter. Thrust shaft is 18 et 5¾ inches long and is supported two steady bearings 19 inches ng.

The thrust bearing is of the collar d shoe type with six babbitted ater cooled shoes having a total fective thrust surface of 840 uare inches.

The propeller shaft is 20 feet 4½ ches long and is supported on one ring bearing 18 inches long and o stern tube bearings having a tal length of 72⅝ inches.

The wheel is of the built up type th cast iron hub and cast iron ades 13 feet in diameter and with tch adjustable from 13 feet 9 inch- to 15 feet 9 inches.

The Sea Giant is equipped with a rge steam towing engine of Amer- an Engineering Company make th two 16 inch by 16 inch cylin- rs, and with 1800 feet of 2 inch ameter 6-37 plow steel towing cable the drum.

The booms on the mainmast are rved by an 8¼"x10" double drum uble gypsy Lidgerwood steam nch, which is capable of handling 720 pounds (3 long tons) at 120 et per minute.

A Lidgerwood 5 inch by 6 inch eam steering engine, controlled om either the pilot house or the atform deck aft, is capable of tting the rudder from hard over hard over in 20 seconds when the sel is moving at full speed ahead.

A six inch fire main fed by the fire and bilge pumps serves four 2½ inch fire plugs located on the ends and sides of deck house, and a four inch monitor nozzle on top of pilot house.

Two 10 K. W. direct current Westinghouse turbo-generator sets take care of lights and small motor requirements.

A new radio installation of the latest Radio Marine Corporation type, and an ultra modern radio direction finder, will keep this tug in touch with the shore and with other vessels and insure safe navigation.

This direction finder is the latest of its type. Developed by the Radio Marine Corporation, it employs a new and highly sensitive balancing system. This set is being installed on several Pacific Coast fleets, notably the vessels of the McCormick Line and of the Alaska Packers fleet, as well as on a large number of vessels operating out of Gulf of Mexico ports.

An important new item in the navigation equipment is a Weule electric sounding machine supplied by the Louis Weule Company of San Francisco.

The Sea Giant's galley has been completely overhauled and a new Rotair fuel oil burning range installed. This range, supplied by the Montague Company of San Francisco, has the important advantage of successfully burning the same fuel oil that is used in the main boilers.

Shipowners and Merchants Tug Boat Company Ltd. now has a well rounded fleet of large seagoing tugs. Its officers are Thomas Crowley, president, and John Bolger, vice president and operating manager. Its fleet consists of 12 large seagoing steam tugs ranging in length from 75 to 156 feet and in horsepower from 250 to 1800.

Combustible-Gas Indicator

A New, Light Weight, Portable Instrument of Great Accuracy

A new combustible gas indicator for measuring directly the combustibility and explodibility of gas-air mixtures has been developed by the Davis Emergency Equipment Co.

In designing this indicator, the object was to produce an instrument that would be as light, as compact, and as economical as possible without sacrifice of accuracy of measurements. The weight of the indicator, complete with batteries, is only six pounds; the dimensions of the instrument panel are 6⅜ x 5⅜ inches; and the depth of the case is 3¾ inches. The instrument is, therefore, easy to handle and carry around.

Current is supplied by two standard dry batteries, thus obviating the difficulty of obtaining special batteries. Two batteries give 3½ hours of continuous operation, and, when used intermittently, as is usually the case, they permit a large number of tests to be made before renewal is required.

The resistance of the platinum filaments used in both the active and comparison cells is controlled within very close limits, which insures the same accuracy found in larger instruments. The two filaments are interchangeable, making maintenance more convenient.

A rugged 3-inch meter shows directly the percentage of the lower explosive limit of the mixture being sampled. The motor is mounted under the panel, with only the scale showing, and is protected from damage by shatter-proof glass. A pushbutton changes the meter reading to volts for checking purposes, and the change can be made while sampling.

The Davis combustible gas indicator is used for measuring the flammability of the atmosphere in tanks and other containers of flammable liquids and gases, ships holds, manholes, conduit systems, and other places where flammable gas-air mixtures may be found. A test can be made in a few seconds, and guards against the danger of introducing flames or sparks or doing welding and other "hot" work in flammable or explosives atmospheres.

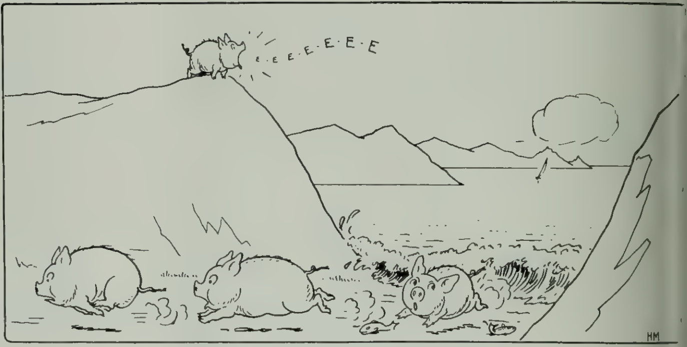
Spunyarns and Catharpins

● **A Fishy Yarn About Pigs.**

The greatest known rise and fall of the tide occurs in the upper reaches of the Bay of Fundy, where ranges of forty feet or more are not uncommon. In such tides a rise or fall of ten feet or more in a single hour occurs frequently, and the two stories related below are cited as effects of these large tides. They are fish and pig stories, the reader being free to choose which of these adjectives to emphasize.

When the tide recedes, it goes so rapidly that fish are left stranded on the wide stretches of mud flats left bare. The pigs in the region descend to these mud flats and eagerly feed on these fish. But before descending to feed, they leave one of their number stationed on a high bluff looking toward the sea. On the approach of the rapid rise of water, this sentry squeals a warning to the herd feeding below, which gives them sufficient time to scamper to safety up the bluff.

[Story and illustration from Field Engineers Bulletin, U. S. Coast and Geodetic Survey.]



Pig picket posted on Bay of Fundy tides.

● **Definitely**

You have often heard the term "swing music," but did you ever know just what was the meaning of that term?

Leopold Stokowski, late of the Philadelphia Symphony, and more currently of the motion picture industry, defines it thus:

". . . a conglomerate combination of underlying unvarying rhythm, with highly syncopated configurations of freely varied melodic derivitives as conceived and executed spontaneously by individual members of the playing organizations without apparent regard to any previously prepared orchestration."

Sounds like a good storm at sea.

Perhaps more like a temperamental Swede.

● **Nautical Ornithologists.**

Three sailors were spending their shore leave in the country and talking about farm stock. Said Jack to Joe, "What's a heifer?"

"It's a sort of pig," said Joe.

"Not on your life," replied Jack, "It's some kind of a sheep."

To settle the argument they called in Bill as a referee.

Said Jack to Bill, "What's a heifer—a pig or a sheep?"

Bill was puzzled. "To tell you the truth, shipmates," said he, "I dunno much about poultry."

— Tennessee Tar.

● **Information Wanted**

All ship captains, radio operators, pursers, stewards, and stevedores will be interested in this quotation from the U. S. Coast and Geodetic Survey Bulletin:

Of the many inquiries received by the Bureau, there is an occasional outstanding request which really fires the imagination. Here is one for the current year:

"Gentlemen:

I want for my work the number of feet depth for at least every square mile of ocean surface. Please designate location of each depth by longitude, and latitude. I would be pleas to have soundings for all inland sea gulfs, etc., that is, all land which covered by water all over tl world. . . .

P. S.: I do not require depths rivers or lakes."

Let us suppose for the mome that data are available to fill th modest order. If the answer cou be typed on letter size paper of stan ard weight, averaging 230 sheets the inch, and the typing sing spaced, with each depth and its c responding position on a single li across the page, it would permit t tabulations of 50 depths to a she Since the water area of the wo is, in round numbers, 140,000,0 square miles, the required tabulati can be crowded on to 2,800,000 shee

The slide rule furnishes so rather startling facts relative to tl sizable paper requirement: Stack in a single column, its 1,014 f height would dwarf the Washingt Monument by 459 feet. The cost the paper alone would exceed $20 and its weight of 15 tons certai would irk the postman delivering reply. At a rate of 1000 depths day, 383½ years would be requi to scale and tabulate the data.

Transoceanic Aviation

In Relation to the Development of the American Overseas Merchant Marine

By Grover Loening

A special survey has disclosed, without contradiction and with widely acclaimed approval, the potentialities of aircraft in transoceanic travel, and the manner in which future giant aircraft will supersede the steamer liner. American aircraft constructors are making rapid strides, particularly in the flying boat type. The China clippers of Pan American Airways have already made an enviable record, and the new Boeing Clippers that will presently succeed them in the service of this company give every promise of an equally great record. They, in turn, will be followed by many designs of even much larger aircraft, and there is every prospect that the present lag in construction of ocean-going airliners—in which four out of our five constructors are at the moment idle—is likely to be taken up if the Government gives sufficient encouragement to the development of companies in the foreign air field.

Our study of this field has indicated that at the present time conditions and lack of initiative on the part of others, and vision and foresight of their own, has resulted in Pan American Airways being virtually a monopoly. The extensive development and expansion of their system has been greatly aided by subsidies in the form of air mail contracts received from the Government in the last nine years.

Whether the continued development of our foreign air trade is desirable in the form of a monopoly system is for the Congress and the President to determine after consideration of the factors involved.

But if steamship companies wish extend their services by the use ocean-going aircraft it would seem sonable and sensible to give them opportunity to do so. And simly, if new groups of young and bitious aircraft operators arise to elop American airlines in this field in the stimulating way in which Pan American has already done so, it would seem within the traditional policies of this country that the circumstances surrounding such development plans should be ones that would encourage their fruition. It is doubtful, however, whether any other companies could, in the immediate future, get a start in any of the various regions of our foreign air trade unless present conditions are very seriously modified to the extent of encouraging their development.

In addition, over-ocean transport must include the consideration of the dirigible airship, which still has potent possibilities, but needs very heavy financial encouragement

An obvious way to meet these conditions is for the passage by Congress of section 215 of the Merchant Marine Act amendments. Failure to do so will by no means ruin our foreign air trade, as the Pan American company will proceed as it has in the past in its own line of development. But it is almost certain that if other companies could get started in different regions without in any way creating undesirable competition to the present established foreign air routes, there would result a much healthier condition than exists at the present.

The Army flight of Major Olds and his six Boeing Bombers from Miami to Buenos Aires in practically one-third of the time taken by regular commercial planes is a marvelous example of how rapidly aviation for long distance transportation is developing, and since Pan American Airways has already ordered virtual duplicates of this type of plane for service on a similar route, it is to be expected that the commercial service by air to the great capital of the Argentine will in the very near future be reduced to at least half of the time that it now takes.

In order to uphold the prestige of American equipment and American operations in the South American sector, Pan American Airways should receive every possible encouragement to develop in this way this field which was its original area of development and in which it rightly deserves every assistance in perfecting its services in the interests of this country.

With the possibilities now demonstrated of speeding up air services to South America no other activity of this company—not even its efforts in the Atlantic—can compare in importance to the need for the maximum possible development of its South American empire as a first and foremost duty, and one to accomplish which the Government should extend every possible assistance.

This great flight of the Army Air Corps shows the tremendous advance that has been made in twelve years, because it was in 1926 that Major Dargue's squadron of Loening Amphibians, using old Liberty engines, made the first slow and halting but finally successful flight around the entire continent of South America, which at the time was the first demonstration of this character that had been done by any nation.

Twelve years is a short time to double the speed, increase the range by over five times, and have perfected navigating instruments and methods and operating systems that give as perfect a result as this great flight demonstrated.

The Maritime Commission, viewing the great distances to be spanned over the ocean, and the promising loads that can be carried non-stop, is further justified in its prediction of success of transoceanic aviation by this magnificent demonstration.

(Grover Loening made this statement on the event of his resignation from the post of Aeronautical Advisor to the U. S. Maritime Commission after completion of a survey on the relationship of aircraft to Merchant Marine Development.)

An Interesting Dredging Job

Pacific Coast Engineering Company Building Shallow Draft Equipment for Harbor Work at Midway and Wake Islands

Two small circles of coral, located out in the wide Pacific west of the Hawaiian Islands, have recently become quite important to the commercial world and to the Federal Government. These are the atolls respectively known as Midway Island and Wake Island. Since their acquisition by the United States and up to the past few years both of these islands were unoccupied U. S. Naval Reservations.

To understand the significance of these atolls and their value to any scheme of transpacific aviation it is only necessary to glance at a map of the Pacific Ocean. There you will see that Honolulu-Midway, Midway-Wake, Wake to Guam and Guam to Manila form four hops of approximately equal length and make possible a regular, dependable service with unit flights of comparatively easy mileage.

The atoll islands of the South Pacific present a rather difficult problem and require special, very shallow draft floating equipment for the job.

Midway Island is approximately 1140 miles in a northwesterly direction from Honolulu. It consists of a barrier reef roughly circular and about 6 miles in diameter, surrounding two islands composed entirely of sand. The largest of these islands, named Sand Island, is about 1.4 square miles in area and rises about 43 feet above sea level. All existing commercial and Government installations are located on this island.

On the westerly side of this ring of coral lies Welles harbor between the outer barrier reef and an inner reef. This harbor, approximately three quarters of a mile wide and one mile long, with a greatest depth of 36 feet, is approached by a tortuous channel known as Seward Roads. The inner harbor or lagoon is approximately 3 miles long and 1 mil wide, with a greatest depth of 6 feet. There are numerous coral pa ches in this lagoon, but an area mile wide and 1 mile long with depth of 24 feet is available for lan ings and for turning basin.

Here the U. S. Army Enginee are to dredge and maintain: an out channel 200 feet wide to a depth 22 feet and 1500 feet long; an inn channel 200 feet wide to a depth 20 feet and 5000 feet long; and harbor basin 1200 feet square and feet deep.

At the atoll known as Wake Islar there is a similar condition but wi much shoaler lagoon and entrance Here the outer ring reef surroun 3 sand islands which in turn su round the lagoon. The islands ha a combined area of approximately square miles and the maximum el vation is only 20 feet. The lagoo with an area of approximately 2 square miles, is generally very sha low, but has an area one-half mi wide and three-fourths mile long the northwestern end with a dep of 12 to 16 feet. Entrances throu the barrier reefs are very shallo being only one foot clear at low tic

Here the Army Engineers are dredge and maintain: an outer cha nel 200 feet least width, 22 feet lea depth at mean low water, and a proximately 2000 feet long; an inn channel 200 feet least width, 18 fe least depth, and approximately 60 feet long; and a harbor basin with least depth of 18 feet and an area 1000 feet square.

To do this work the U. S. Arr Engineers have designed and n have under construction a numb of items of shallow draft floati equipment. These include:

One 27-foot wooden constructi towing launch fitted with a 75-hor

A dump scow taking shape at yard o Pacific Coast Engineering Company.

per Gray gasoline engine and suital gearing connection to propeller;

ne welded steel drill barge for dling and blasting operations;

ne welded steel clam shell dredge bge;

wo welded steel barges;

wo welded steel dump scows;

wo welded steel anchor and oil rges.

ll of the contracts for this work, toling well in excess of $150,000, ar being let to firms in the San Fncisco Bay area. The bulk of this wk is being done at the Oakland plt of the Pacific Coast Engineerin Company. Contracts to this compy include:

wo welded steel dump scows;

ne welded steel clam shell dredge bge;

ne welded steel drill barge.

hese will approximate $135,000 tol cost.

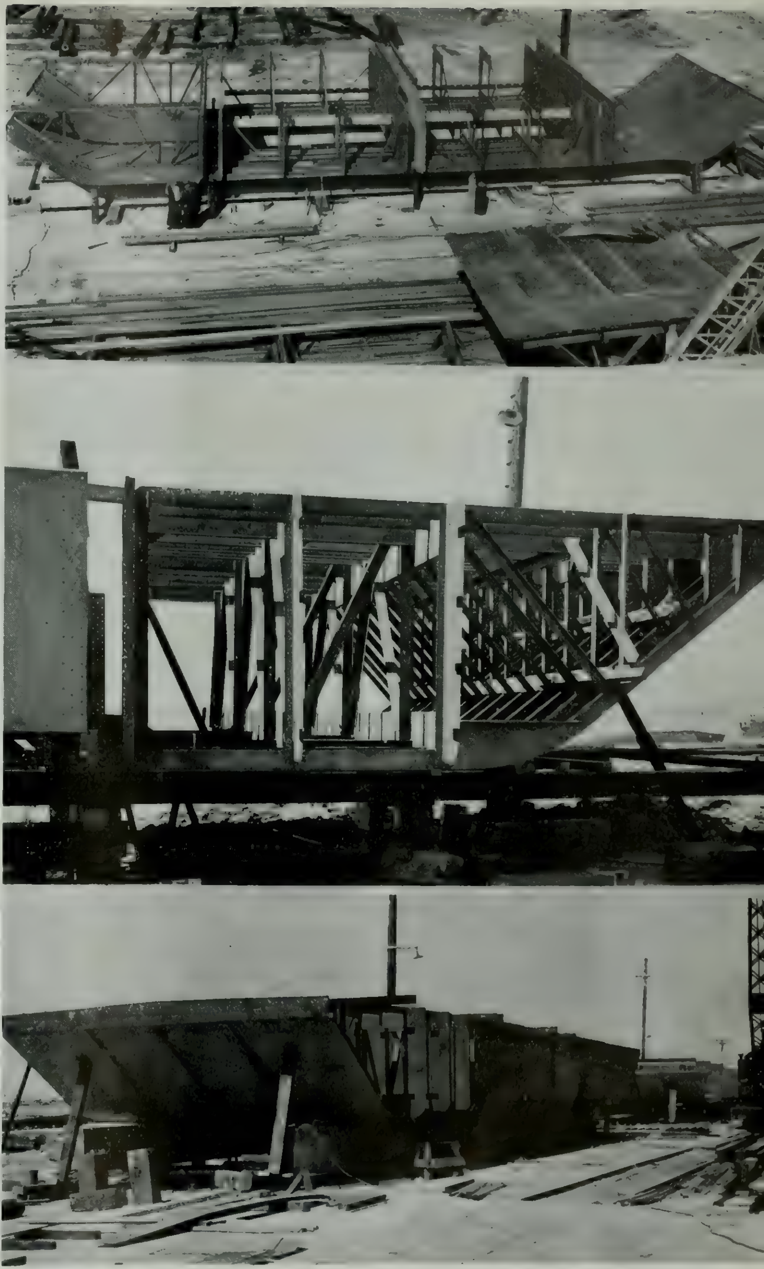
● Two Dump Scows

ince this equipment is to be trsported to Midway Island on Any transports, it is all made in uits or pontoons small enough to be hdled on the deck of the transport.

ach scow will be composed of fr pontoons, each pontoon being a cplete water tight unit. When assbled, each scow will have the fowing dimensions:

ength molded	78′ 0″
ength overall	78′ 9⅝″
eam molded	26′ 0″
eam overall	26′ 9¼″
epth molded at gunwale	7′ 0″
epth molded at centerline	7′ 3″
otal hopper capacity	120 cubic yards

hese scows are of the bottom dp type with flat bottom, raked ers, and round bilges. Each has 2 pontoons and 2 center pontoons. T center pontoons carry the hopps, the hopper dump-doors, and a iple ratchet chain and capstan wel type, manually operated door ning and closing mechanism. Tse doors close on rubber gaskets to form a practically water tight it.


Progress views of the welded fabrication of two dump scows at the Pacific Coast Engineering Company, Oakland, Calif.

he pontoons are made with an exsion of the bottom which carries eavy angle. This angle is drilled bolting so that the pontoons n afloat can easily be brought ether and bolted into a complete t. Each pontoon is completely welded in place at the shipyard with bolted joints cinched up. A careful check on welding procedure is maintained so as to avoid warping and locked up heat stresses. Lincoln shielded arc welding machines are used and Lincoln welding rod.

● Clam Shell Barge

The clam shell barge is also now under construction. This structure is also composed of four pontoons built and bolted together in the same manner as the dump-scow pontoons.

(Page 48, Please)

Hercules Announces Complete Gasket and Packing Division

The Hercules Equipment and Rubber Co. of San Francisco has now completely rounded out its packing and gasket divisions with the most complete manufacturing and marketing service to be found west of Chicago.

Hercules recently acquired The Gasket Shop, which, for 17 years, has manufactured a full line of copper, steel, rubber, cork, lead, asbestos and many other types of gaskets for industrial, steamship and automobile trades. The machinery and stock of The Gasket Shop has been moved to a location adjacent to the Hercules Equipment and Rubber Company's plant and will be operated as The Gasket Division.

Hercules had already developed a fine line of metal and metal-asbestos-filled gaskets in both plain and corrugated types; heat exchanger gaskets of all types; and marine gaskets of all types. The Hercules plant is equipped to spin and cut gaskets up to 8 feet in diameter in copper, steel, stainless steel, aluminum, Monel metal, brass, lead, or any specified alloy.

With the present equipment, Hercules is prepared to manufacture any standard gasket and to duplicate any special gasket required. This is the only complete gasket service of its kind west of Chicago.

The Packing Department of the Hercules Equipment and Rubber Co. now comprises a complete packing service. As distributors, this division includes the following well-known brands:

Durabla Packing
Belmont Packing
France Packing
Q-P Packing
Rhodes Metallic
Vellumoid Packing

This wide representation of complete lines enables the Hercules organization to prescribe the packing best adapted to meet any special condition.

This organization, representing a vast practical experience in both gasket and packing problems, invites Pacific Coast users of these products to consult with them.

Book Reviews

The Motor Ship Reference Book for 1938: 300 pages, profusely illustrated with half tones, diagrams and drawings, and with much tabular statistical material; bound in blue buckram with black stampings. Published by Temple Press, Ltd., London; price 5/- net.

More than 14 million gross tons of motor ships were in service at the beginning of 1938. This remarkable growth in the importance of oil-engine propulsion coincides with the publication of the 14th edition of this reference book. The new enlarged edition now comprises nearly 300 pages, together with many folding plates of sectional drawings. These plates provide useful information on the construction of the principal types of marine diesel engines and, in addition, the work is illustrated by large numbers of photographs of main and auxiliary installations.

The section on oil-engined vessels in service, excluding those under 2,000 tons gross, has been enlarged to include a list of motor ships completed in 1937. In this connection the publication reveals the interesting fact that the motor ship tonnage under construction to September, 1937, represented 57.5 per cent of the world's total for ships of all types.

Further figures that serve to emphasize the importance of this reference book to the Mercantile Marine show that the 1937 output of marine diesel machinery totaled nearly a million horsepower. There were 400 large motor ships on order at the beginning of 1938, aggregating 2,750,000 gross tons.

Elements of Diesel Engineering, by Orville Adams, consulting diesel engineer; 478 six-inch by nine-inch pages with 332 illustrations; bound in red buckram with gold stampings. Published by Norman W. Henley Publishing Co.; price $4.00 net.

The avowed purpose of this book is to help in "preparing men to enter the wide field" of manufacture, operation and service of diesel engines in their application to automotive, marine, stationary, and industrial services in America.

The author is a recognized authority on modern oil engines and has had specialized training and experience in training men for business and industrial work, as well as long experience in operation and servicing of diesel engines.

This book carries at the close of each chapter a comprehensive review in question and answer form that should be very helpful to the student. Much original data, based on the author's experience, are included in the text. Any American student interested in diesel engine development should read this book.

The American Society of Heating and Ventilating Engineers, New York, announces publication of the **1938 Heating, Ventilating and Air Conditioning Guide,** official reference book of the society, price $5.00. Distribution is being effected to engineers, architects, contractors, trade schools and colleges, purchasing agents, manufacturers, public utilities and other factors in the air conditioning and allied industries.

This year's issue, the 16th consecutive edition, contains 840 pages of technical reference data included in 45 chapters covering material on design and specifications of heating, ventilating and air conditioning systems. Important new material has been added on the cooling phases of air conditioning practice. This includes extensive revisions of chapters on Refrigerants and Air Drying Agents, Cooling Load Determinations and design of Central Systems for Cooling and Dehumidifying.

In addition to the technical material, over 300 pages of catalog data by 218 manufacturers is included, as well as an index to modern equipment listing 300 items, cross indexed as to product and manufacturer. A complete listing of society members, including their professional or business connections, is also included.

Montague Seagoing Ranges

A Galley Stove that Burns the Same Oil as the Ship's Boilers and Rates Very High in Cooking Economy and Efficiency

Since 1857, for three generations Californians the name Montague s symbolized good cooking equip- nt, and today The Montague Com- ny is manufacturing an oil burn- g range for the kitchens of our st hotels and the galleys of our st ships.

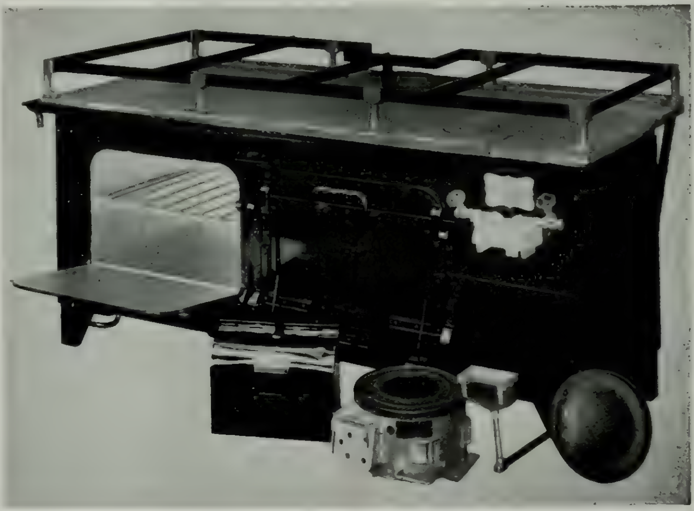
Rotair steel galley ranges are ilt in standard sizes or specially ilt to suit the space and shape of y ship's galley. Designed to give e most efficient combustion and e most effective heat transfer, this nge is constructed with ample mar- ns of safety from the very best of aterials.

As shown in our illustration, this nge is of smooth, straight line de- gn, easily maintained in a clean, nitary condition outwardly and ith interiors easily accessible for aintenance and cleaning.

Specifications for this range indi- te a very heavy, durable construc- on that will stand up under very vere usage at sea. The top is of rench pattern, and for the two oven ze has a surface of 8 feet 2 inches y 40 inches.

Number 10 gage blue sheet steel rms the body, and is reinforced at rners with 3/16 inch by 1½ inch ngles and at the bottom with a ¼ nch steel band 3 inches wide. End, ack, and bottom flues, and the back f the range, are insulated with two nch thick magnesia blocks covered ith number 14 gage blue steel.

All ovens are 24 inches by 27 nches, and are built of No. 7 gage lue steel with heavy cast iron ngles at corners. Refractory protec- ection is provided at the tops of vens and on the sides of the top lue by split fire brick laid in High- eat Fire Cement.



The Montague seagoing type fuel oil burning galley range with burner removed for inspection.

Oven doors have heavy wrought iron frames and handles made in the balanced drop pattern and riveted to No. 12 gage steel.

Rotair ranges are equipped with the famous Rotair fuel oil burner. This burner uses the same oil as the ship's main boilers. It is a simple device without moving parts. It works on scientific principles and natural laws. Oil flows in by gravity together with a small quantity of water. Burning with a clean, silent flame that utilizes the full amount of heat in every gallon of oil, this burner performs with surprising fuel economy.

Of special advantage to the Pacific Coast shipowner is the location of the manufacturing plants of The Montague Company in San Francisco. Ranges may be ordered to special dimensions without prohibitive costs.

Rigid adherence to a traditional policy of building for quality and performance has given the Rotair oil burning galley range as built by The Montague Company of San Francisco a high reputation as galley equipment that will do what a good cook wants a good stove to do under all conditions aboard ship.

A Montague Rotair galley range, with reasonable care, will give satisfactory performance over long periods; in fact, some ship chefs say these stoves will outlast the ship.

Among the many satisfied users of Montague ranges are: The Luckenbach Steamship Company, the American-Hawaiian Steamship Company, Matson Navigation Company, several of the large tanker fleets, and a number of the larger seagoing tugs and fishing vessels.

On the Ways -

SHIPS IN THE MAKING

LATEST NEWS FROM AMERICAN SHIPYARD

Lloyd's Report on American and World Shipbuilding

Lloyd's returns for the quarter ending March 31, 1938, show tonnage under construction in vessels 100 tons gross and over to be 5488 tons less than that of the quarter ending December 31, 1937, but 442,645 tons more than that of March 31, 1937. The total under construction March 31 was 827 vessels of 2,894,696 gross tons. Seven nations had the bulk of this total. These were, in the order of shipbuilding volume:

Great Britain and Ireland	239 ships	1,089,977 tons
Germany	134 ships	370,118 tons
Holland	118 ships	310,667 tons
Japan	90 ships	303,779 tons
United States	47 ships	172,764 tons
Italy	22 ships	159,685 tons
Sweden	30 ships	119,880 tons
Total 7 nations	680 ships	2,526,870 tons

On the face of these figures our position as a maritime nation looks rather weak, but when we reduce the figures to actual seagoing vessels we are so low as to appear ridiculous in comparison with the other six. Subtracting our Great Lakes tonnage and our construction in large steel barges, we have 24 vessels with a gross tonnage of 127,674.

This is, of course, being increased rapidly, as the 12 large, fast tankers of the Maritime Commission, the four C-2 Standard Cargo motorships of the Maritime Commission, and the other subsidized building programs come onto the ways.

The main point for the American in these figures is that for a country in which such a large proportion of ocean trade originates we are away behind the other maritime nations in our shipbuilding program.

McCormick to Build Six Cargo Liners

On April 20 the McCormick Steamship Company of San Francisco issued the following statement:

"The essentiality of the shipping route from the Pacific Coast to the East Coast of South America has been determined by the United States Maritime Commission, according to advices received yesterday from Washington. The Commission stated it would immediately confer with the Pacific Argentine Brazil Line (McCormick Steamship Company) for the continuation of its service on this route.

"This conclusion was based on findings made by the Maritime Commission representatives at hearings in Pacific Coast cities during January and February.

"Negotiations between the Pacific Argentine Brazil Line and the Maritime Commission for a long-term subsidy contract have been carried forward for several months and should now reach a definite conc sion in the next several days.

" 'We are very pleased to have th route declared essential,' stat Charles L. Wheeler, executive vi president of the company. 'It h been under our operation sine 19 Continuation of the service will i volve construction of five or s 9000-ton ships.' "

When bids for these ships are ca ed, the Pacific Coast shipbuilde will have a 6 per cent differential the bidding and should be able land a part or all of them for co struction on this coast.

Tug for Army Quartermasters Departme

The U. S. Army Quartermaste Department, Fort Mason, San Fra cisco, are calling for bids on a st tug for harbor and coastwise serv at Honolulu.

This boat will be of following mensions:

Length O. A.	75 feet, 4 inches
Length B. P.	70 feet
Beam	18 feet
Depth	10 feet, 5 inches
Draft	8 fee

Her engine will be a direct c nected, fully reversible, six cylind 300 B.H.P. diesel, with self-conta ed pumps for all services. Tr speed to be 11 statute miles an ho

She will have a 15 H.P. auxilia diesel driving through clutches a K.W. generator or an air compress Pacific shipyards only are biddin

Moore Builds Bay Freighter

On April 21 the Moore Dry Dock mpany, at their Oakland yard, laid e keel for a cargo vessel for the rbor service of the Bay and River vigation Company of San Fran- co.

This vessel will be of steel con- uction and will have the following mensions:

Length	183 feet
Beam	40 feet
Draft, loaded	10 feet
Capacity	750 tons
Propulsion H. P.	550
Speed, estimated	11 M.P.H.

Two Union diesel engines, each veloping 275 shaft horsepower, ll form the propulsion plant. A rlow freight elevator will be in- alled. Several new and interesting sign details are incorporated and ll be described and illustrated in feature article in a forthcoming is- e of Pacific Marine Review.

Grace Line Pacific Services

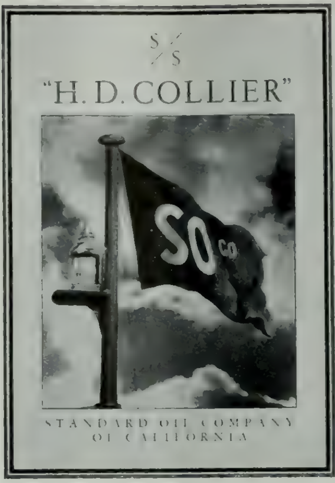
As of April 19 the Maritime Com- ission has declared essential under e Merchant Marine Act of 1936 the rvice between the West Coast of e United States and the West Coast South America. The Commission now negotiating a permanent op- rating subsidy contract with the race Line for the maintenance and nprovement of this service.

A condition incident to the grant- g of permanent operating subsidy ill be the construction of new and ster vessels to operate on this ser- ce.

When bids are called on these ves- ls, Pacific Coast shipbuilders will ave a 6 per cent differential in the ilding cost.

merican Export Calls for Bids

On April 4 the United States Mari- me Commission, in behalf of Am- rican Export Lines, Inc., of New ork City, invited bids for the con- ruction of 4 cargo vessels. The ids will be opened by the Commission on Tuesday, May 17.



This attractive design in black and red formed the frontispiece of a description of the new tanker H. D. Collier that was distributed to all visitors aboard that vessel by the Standard Oil Company of California.

The vessels are to be built by the American Export Lines under the terms of the operating subsidy contract recently signed with the Commission, in which it agreed to build 10 new cargo ships in the next 5 years, construction of 4 of the vessels to start this year. This company now employs 24 ships in its services between North Atlantic and Mediterranean ports, comprising one of the largest fleets in the American merchant marine.

All bids must be submitted on a fixed lump sum price basis, although bidders also may submit tenders on an adjusted price basis, which provides for an adjustment of the contract price on account of increases or decreases in the cost of materials or labor where such adjustment does not exceed fifteen per cent of these costs.

Shipbuilders may bid on from 1 to 4 vessels. No bid will be considered by the Commission which fixes the time of completion for 1 ship in excess of 450 calendar days.

The new vessels will be built to a standard design developed by the American Export Lines and approved by the Commission and the Navy Department.

These vessels will have the following general characteristics:

Length overall	475′ 1″
Length B. P.	450′ 0″
Beam	66′ 0″
Draft Loaded	27′ 0″
Deadweight capacity	8775 tons
Displacement	14450 tons
Shaft horsepower	8000
Sea speed	16½ knots

They will be single screw full shelter deck type with double reduction geared steam turbine propulsion. No provision is to be made for passenger trade.

Maritime Commission Invites New Bids

On April 11 the U. S. Maritime Commission rejected all bids for the eight steamers of the C-2 Standard Cargo Vessel design, after having previously approved the bid of the Tampa Shipbuilding Company for four motorships of that design. At the same time, the Commission invited new proposals for 12 of the same type with a limit of six ships to any one shipyard. The new bids are to be opened May 3.

Delivery and Launching at Pusey & Jones

On April 14 the Pusey and Jones Corporation at Wilmington, Delaware, launched the cargo vessel Cavalier for the Philadelphia and Norfolk Steamship Company, and on the following day delivered a sister ship, the Quaker, to the same firm:

These vessels have the following particulars:

Length O. A.	292 feet
Length B. P.	280 feet
Beam	48 feet, 6 inches
Depth to Hurricane deck	32 feet, 3 inches
Depth Main Deck	23 feet
Load Draft	18 feet, 6 inches
Displacement	4090 tons
Deadweight capacity	1900 tons
Volume cargo capacity	190,500 cu. ft.

Each vessel has 2 Babcock and Wilcox marine single pass water tube boilers furnishing steam to a General Electric cross compound turbine connected to the propeller shaft by double reduction gearing and developing 4000 shaft horsepower at 120 revolutions of the propeller. Boilers operate at 420 lbs. pressure 720° F. The turbine exhausts into a Wheeler underslung condenser. This turbine can operate continuously at 20 per cent overload or 5000 H.P.

Other items of propulsion and auxiliary equipment are:

Todd fuel oil burners
Worthington pumps
Diamond soot blowers
Bailey feed water regulator
Davis heaters
Schutte & Koerting coolers
American Engineering steering gear, windlass, capstan
Westinghouse auxiliary generating sets
McLauthlin cargo elevators
Carrier refrigerating machinery.
Lux fire extinguishing systems.

All cargo is loaded and discharged through side cargo ports.

Interesting Dredging Job

(Continued from Page 43)

It has the following general dimensions:

Length molded	68′ 0″
Length overall	68′ 9¼″
Beam molded	32′ 0″
Beam overall	32′ 9¼″
Depth molded	6′ 0″

The two central pontoons of this barge are made for bolting together longitudinally. A longitudinal girder bulkhead is fitted in each of these two pontoons on a line 4′ 7½″ from the inboard side of the pontoon. The same type of longitudinal bulkheads are fitted in each end pontoon 4′ 7½″ from the center line port and starboard. These girder bulkheads support the deck in way of the caterpillar tractor which works the clam shell bucket falls and boom for dredging.

Three spud wells are fitted in this barge constructed of ⅜-inch steel plating with cast rings of nickel steel fitted at deck and bottom plating. A portable nickel steel ring bearing is fitted in each well. Five spuds are furnished with the barge, four of them 35 feet long and one 25 feet. These spuds are each 16″ in outside diameter, made of seamless hydraulic steel pipe as furnished by the National Tube Company, with walls ¾ inch thick.

Two "Silent Hoist" 20 horsepower gasoline engine drive winches, one right and one left hand with two gypsey heads are mounted one on each center pontoon to handle these spuds. Each of these winches will be capable of exerting a pull of 10,000 pounds on the line at the rate of 40 feet per minute.

● The Drill Barge

Specifications for the drill barge describe a welded steel barge with the following general dimensions:

Molded length	44′ 0″
Overall length	44′ 7¼″
Molded beam	22′ 0″
Overall beam	22′ 7⅛″
Molded depth	5′ 0″

This hull is to be divided into five water tight compartments by four water tight bulkheads.

Four spud wells are built into the hull, with proper reinforcing. Five spuds (one spare) are to be provided. These spuds are to be fabricated of National Tube company seamless hydraulic steel pipe, 36 feet 8 inches long and turned straight and true to a finished outside diameter of 12⅝ inches.

Four complete pneumatic cylinder spud lifting units are to be installed on the deck, one at each spud well. Anchor Brand spiral asbestos or equal is to be used for the piston rod packing, and Anchor cup leathers on the piston. These spud lifting units will be fitted with Nicholson four way valves.

A drill tower 38 feet long and 36 feet high is to be erected on the starboard side of this barge. This tower carries at its top a steel I beam running full length fore and aft for the drill ladder trolleys, and at a point 9 feet 2 inches above the deck it carries a fore and aft rail for drill ladder clamps. Two complete drill ladder units are to be furnished, each equipped with trolleys, working platforms, air hoists, guide wheels, clamps, air drifter drill, and air and water piping and hose.

The air drifter drills and the air hoists are to be Ingersoll-Rand or equal. All flexible air and water hose is to be that made by Pioneer Rubb Mills of San Francisco or equal an is to be equipped with Ingersoll Ran couplings.

Provision is to be made for moun ing on deck two portable air con pressors now at Honolulu. Two dou ble drum Ingersoll Rand utility a hoists capable of exerting a 200 pound rope pull at 130 feet a minu are to be installed one at each end the barge. These hoists will serve a warping winches or will take care any general lifting required.

A Kohler automatic, gasoline en gine drive 1½ K.W. electric genera ing plant will be installed on de and housed in metal weatherpro enclosure. This plant will take ca of current for detonating and f general lighting purposes.

● Shipment of Barges

All four of these barges are to completely assembled at the yard the contractor and then disassem bled and delivered at the U. S. Arm Transport Dock, San Francisc From thence they will be taken o the decks or in the holds of U. Army Transports to Midway, a there reassembled by the Army E gineers on the job.

The plant of the Pacific Coast E gineering Co. on the Oakland out harbor basin is well located and ad quately equipped for this type work. The site is that formerly occ pied by the Union Construction Con pany. Here in former years we built many gold dredges, Shippi Board vessels, Coast Guard cutte and other craft. There is 30 feet water at the outfitting dock. The is ample provision of plate and sha fabricating machinery. Welded fa rication is a specialty with this fir and their equipment in this special is modern and conveniently arran ed for efficient work.

A large area of bending slabs equipped with ample furnace volun to heat large shapes and with amp portable pneumatic or hydraul jacks for pressure bending.

The organization personnel Pacific Coast Engineering rep sents a very large experience welding, and has worked out a sa procedure in the welded fabricati of small and medium sized mari craft that guarantees a satisfacto result.

Building in American Yards

Pacific Coast

BETHLEHEM SHIPBUILDING CORPORATION, LTD.

(Union Plant)
San Francisco

EW CONSTRUCTION: **Hull 5355—M all (DD400).** Launched November 2, 1937; completion date March 1, 1 ; estimated delivery date May, 1 8.

ull 5356 — Maury (DD401); launched February 14, 1938; completion date June 1, 1938. Two 1500-ton destroyers for U. S. Navy; length, 341′ 3″; beam, 35′ 6⅛″; depth, 19′ 8″. C t $3,675,000.

RYDOCK AND ROUTINE REPAIRS: **Amiral Laws, Coya, M.S. Hauraki, Pa c Reliance, Curaca, Mariposa, Capac, sident Coolidge, Ewa, Vitas Bering, Su. Sch. Bandon, M.T. Atheldukė, Claretta.**

FELLOWS & STEWART, INC.

Wilmington, Calif.

EW CONSTRUCTION: **Contract No. 64, 65 foot combined passenger and p ty boat. Completion date May 1, 1 8.**

ontract No. 671, 37 foot auxiliary rconi sloop. Completion date about y 15, 1938.

DRYDOCK AND ROUTINE RE IRS: **Katinka, Kuru, Quest, Seyelyn Alrene, Torqua. 42 smaller yachts l commercial boats.**

GENERAL ENGINEERING & DRY DOCK CO.

Foot of Fifth Avenue
Oakland, Calif.

DRYDOCK AND ROUTINE RE IRS: **Lumberman, M.S. Hawaiian andard, Barge No. 200, Dredge Dan Kingman, Captain A. F. Lucas, Cath ne Sudden, Barges Nos. 17 and 19, gs Despatch No. 6 and No. 7.**

HARBOR BOAT BUILDING CO.

Berth 264, Fish Harbor
Terminal Island, Calif.

DRYDOCK AND ROUTINE RE IRS: **Tuna Boat Chicken of the Sea; rse Seiners St. Joseph, New Conte Di voia, Nancy Rose, Sea Pride, City of n Pedro, Sea Rover, Sea Breeze, Yan e Clipper, Bremen.**

HONOLULU IRON WORKS

Honolulu, T. H.

DRYDOCK AND ROUTINE RE IRS: **M.S. Olymp, Federal, President veland.**

LAKE WASHINGTON SHIPYARDS

Houghton, Wash.

DRYDOCK AND ROUTINE REPAIRS: **Gen. W. C. Gorgas, North Coast, W. M. Tupper, Yachts Aquilo and Malibu, U. O. Co. Barge No. 3 (Seattle), U. S. Dept. Fisheries Kittiwake, Whaler Paterson, Tug Venture, Yacht Nor'-wester, Halibut Sc. Paragon, Halibut Sc. Akutan, Salmon and Tuna Clipper Martindale, Salmon Troller Reliance; U. S. Dept. Fisheries Auklet, Scoter, Teal, Blue Wing.**

LOS ANGELES SHIPBUILDING & DRY DOCK CORP.

Los Angeles Harbor
San Pedro, Calif.

DRYDOCK AND ROUTINE REPAIRS: **M. V. Romancia, L. A. Fireboat No. 2, M. V. Velma, Warwick, M. V. Tooya, Deroche, Astoria, Samoa, M. V. Vera, West Ira, M.V. Bengalen.**

MARE ISLAND NAVY YARD

Mare Island, Calif.

NEW CONSTRUCTION:

Sturgeon, Submarine (SS187); keel laid October 27, 1936; estimated launching date March 15, 1938; estimated delivery September, 1938.

Swordfish, Submarine (SS193); keel laid October 27, 1937; estimated delivery date August 1, 1939.

Order received for construction of two harbor tugs, YT 133 and YT 134, October 7, 1937.

Order received for construction of garbage lighter (YG21), dated February 8, 1938.

DRYDOCK AND ROUTINE REPAIRS: **Cincinnati, Concord, Robin, Tern, Arctic, Melville, Hamilton, Dallas, Pike.**

THE MOORE DRY DOCK CO.

Oakland, Calif.

DRYDOCK AND ROUTINE REPAIRS: **Tug Hercules, Frances, Patterson, St. Mihiel, Roseville, Delawarian, Janidore, San Gabriel, Georgian, Columbian, H. T. Harper, Frederic R. Kellogg, Stjerneborg, Lake Frances, Iowan, El Capitan, Vermont, Manoeran, Vancouver, Pennsylvanian, Shasta, Tug Gleaner, Calif. Star, Tug Sunshine, Balboa, Dot. Luckenbach, Shabonee, Fermia, El Commodore, Californian, Chirikof, Damsterdyk, W. B. Walker, Silverwillow, Minnesotan, H. M. Storey, Bengalen, General M. H. Sherman, J. A. Moffett, Floridian, Kailua, Canada, New St. Joseph, Solana.**

THE PUGET SOUND NAVY YARD

Bremerton, Washington

NEW CONSTRUCTION:

U.S.S. Wilson (Destroyer No. 408); standard displacement, 1500 tons; keel laid March 22, 1937.

U.S.S. Charles F. Hughes (Destroyer No. 428); standard displacement 1600 tons; order placed by Navy Department December 7, 1937.

DRYDOCK AND ROUTINE REPAIRS: **West Virginia, Colorado, Idaho, Ingham, Spencer.**

TODD SEATTLE DRY DOCKS, INC.

Harbor Island
Seattle, Wash.

DRYDOCK AND ROUTINE REPAIRS: **President Jackson, African Reefer, Yukon, M.S. Missourian, Derblay, Tug Neptune, F. J. Luckenbach, K. I. Luckenbach, Point Palmas, Baranof, Tug Iroquois.**

WESTERN BOAT BUILDING CO., INC.

2505 East 11th Street
Tacoma, Wash.

NEW CONSTRUCTION:

Hull No. 130 Western Explorer, purse seine fishing vessel 81 x 20 x 9.5 ft.; powered by 200 H.P. Atlas 6 cylinder diesel. Keel laid October 10, 1937; launched February 1, 1938; **completed April, 1938.**

Hull No. 131, purse seine fishing boat, 78′x20′x9′; 200 H.P. Atlas engine; **launching date May 1, 1938.**

Hull No. 132, 50′ pick-up fishing boat for New England Fish Company. Keel laid March 12, 1938.

DRYDOCK AND ROUTINE REPAIRS: **Fishing Boats A. F. Rich, O. M. Arnold, Oregonian, Caleb Haley, Reliance, Argo, Fearless, Sitka, Empress, Success.**

Atlantic, Lakes, Rivers

AMERICAN BRIDGE CO.

Pittsburgh, Pa.

NEW CONSTRUCTION: **10** cargo **barges** 132′ x 35′ x 10′ for Campbell Transportation Co., Pittsburgh, Pa. **Delivery dates April, 1938 to September, 1938.**

THE AMERICAN SHIP BUILDING COMPANY

Cleveland, Ohio

NEW CONSTRUCTION: **Two bulk lake freighters** 610′ x 60′ x 32′ 6″; 2,000 I.H.P. geared turbine, water tube boilers, 400 lbs. pressure, electric auxiliaries; for Pittsburgh Steamship Company. Keels laid June 21, 1937; and July 6, 1937; launching dates November 10 and December 2, 1937; **delivery date May 15, 1938.**

BATH IRON WORKS

Bath, Maine

NEW CONSTRUCTION: Hulls Nos. 161, 162, and 163; **DD394 Sampson. DD395 Davis and DD396 Jouett;** Three 1850-ton destroyers for U.S. Navy; date of contract September 19, 1935. Keels laid, No. 163, March 26, 1936; No. 162, July 28, 1936; No. 161, April 8, 1936; **No. 161 launching date April 16, 1938;** others indefinite; estimated delivery dates June, August and October, 1938, respectively.

Hulls Nos. 170-171, DD409, Sims, and DD410, Hughes, two 1500-ton destroyers for U. S. Navy; contract date October 12, 1936; keels laid July 15 and September 15, 1937, respectively; launching dates, indefinite; delivery dates April, 1939, and June, 1939, respectively.

Hulls Nos. 177 and 178, DD423 and DD424, two 1620 ton destroyers for U. S. Navy. Contract date September 30, 1937; delivery dates April and June, 1940, respectively.

BETHLEHEM SHIPBUILDING CORPORATION

Fore River Plant,

Quincy, Mass.

NEW CONSTRUCTION:

CV7, Wasp, Airplane Carrier for U.S. Government; keel laid April 1, 1936; estimated delivery, November, 1938.

Hulls Nos. 1467, 1468, 1469, three passenger and freight steamers for Panama Railroad S.S. Co.; 486 feet x 64 feet x 38 feet 6 inches; 16½ knot speed. Keels laid Nos. 1467 and 1468, October 25, 1937; No. 1469, November 15, 1937.

Hulls Nos. 1470 and 1471, two 1500 ton destroyers for U. S. Government; delivery dates March, 1940 and May, 1940.

BETHLEHEM SHIPBUILDING CORPORATION

Sparrows Point Plant

Sparrows Point, Md.

NEW CONSTRUCTION:

Four 13,000 deadweight ton steam turbine driven tankers for Standard Oil Co. of N. J.; length 442′, beam 64′, depth 34′ 10″, gross tonnage 7,600, speed 12 knots. Esso Baton Rouge launched November 13, 1937; **delivered April, 1938.** R. W. Gallagher launched January 22, 1938.

One tanker for Texas Co.; about 13,000 deadweight tons; steam turbine.

Hull No. 4334; one 13,000 dwt. oil tanker for Union Oil Co. of Calif. Contract signed March, 1938.

Hulls Nos. 4329, 4330, 4331; three 16,300 dwt. ton tankers for Standard Oil Co. of N. J.; 18 knots speed. Contract signed January 3, 1938.

Hulls Nos. 4332 and 4333; two 16,000 dwt. tankers for Socony Vacuum Oil Co. Contract signed February, 1938.

BOSTON NAVY YARD

Boston, Mass.

NEW CONSTRUCTION:

DD402, Mayrant, and DD403, Trippe, two light destroyers for United States Navy; LPB 334′; beam 35′6″; depth 19′ 8″; keels laid April 15, 1937; **launching date May 14, 1938;** estimated delivery dates August, 1939 and October, 1939, respectively.

DD415, O'Brien, and DD416, Walke, two destroyers; LBP 341′, beam 36′, depth 19′8″; keel laying date June 1, 1938; delivery dates indefinite.

DD425, Madison, and DD426, Lansdale, two destroyers; 341′0″ x 36′0″ x 19′8″.

One harbor tug for U. S. Navy; 98′0″ LBP x 24′0″ x 13′6″; keel laid March 28, 1938; launching date June 6, 1938; completion date September 15, 1938.

BROOKLYN NAVY YARD

Brooklyn, N.Y.

NEW CONSTRUCTION:

CL 48, **Honolulu,** light cruiser; L.B.P. 600′; beam 61′8″; standard displacement 10,000; geared turbine engines; express type boilers; keel laid September 10, 1935; launched August 26, 1937; estimated delivery, August 1, 1938.

CL 50, **Helena,** light cruiser; L.B.P. 600′; beam 61′7¾″; standard displacement 10,000; geared turbine engines; express type boilers; keel laid December 9, 1936; estimated launching date January 9, 1939; estimated delivery January 2, 1940.

BB 55, **North Carolina,** battleship; L.B.P. 714′ 0″; beam to outside armor 108′ 0″; std. displ. 35,000 tons; geared turbine engines; express type boilers. Keel laid October 27, 1937; estimated launching date May 1, 1940; contract delivery August 1, 1941.

CHARLESTON, S. C., NAVY YARD

Charleston, S.C.

NEW CONSTRUCTION:

Order placed for one **harbor tug;** LOA 124′ 9″, length between perpendiculars 117′, breadth, molded, 28′, depth, molded, 16′; keel laid August 2, 1937; launched March 7, 1938.

Order placed for **one harbor tug;** LOA 110′ 3″; LBP 98′ 0″; breadth 24′ 0″; depth at side amidships 13′ 6″. N dates set.

Order placed for one **harbor tug;** 6 feet long.

DEFOE BOAT & MOTOR WORKS

Bay City, Mich.

NEW CONSTRUCTION:

One diesel yacht, powered by 1,00 h.p. Winton engines; 143′ long, 2 beam; steel construction. For Cox an Stevens, New York, N.Y. Delivery dat **May** 1, 1938.

Two diesel electric towboats 94′x25 steel construction; powered by 100 S.H.P. General Motors engines. For Ge eral Motors Sales Corp. Delivery dat June, 1938.

Hulls Nos. 72 and 73; two dies electric harbor cutters for Coast Guard 110′x26′6″; powered by 1000 S.H. General Motors engines; steel constru tion. Delivery date April, 1939.

One diesel yacht 49′ 6″ x 11′ 6″ f A. J. Fisher, Detroit, Mich. Powere by 300 S.H.P. Gray conversion of Ge eral Motors engines; wood constru tion. Delivery date June 1, 1938.

THE DRAVO CORPORATION

Engineering Works Division

Pittsburgh, Pa., and Wilmington, Del

NEW CONSTRUCTION:

Hulls Nos. 1440-1444; five type W- welded steel coal barges 175′ x 26′ 10′8″; for stock; 2360 gross tons.

Hull No. 1452; one welded steel o barge 195′ x 35′ x 9′6″, for stock; 48 gross tons.

Hulls Nos. 1453-1454; two 1200 c yd. welded steel dump scows 206′ x 4 x 14′, for Merritt-Chapman & Sco Corp.; 2092 gross tons.

Hulls Nos. 1455-1456; two welde steel coal barges for stock; 1346 gro tons.

Hulls Nos. 1457-1461; five welde cargo barges 280′ x 47′ x 11′, for I land Waterways Corp., 7220 gross ton

Hulls Nos. 1462-1465; four welde cargo box barges 100′ x 26′ x 6′6″ f stock; 660 gross tons.

Hulls Nos. 1466-1475; ten welde W-4 coal barges 175′ x 26′ x 10′ 8″ f stock; 4720 gross tons.

This makes a total of 29 hulls with total gross tonnage of 18,887 tons.

ELECTRIC BOAT CORP.

Groton, Conn.

NEW CONSTRUCTION:

Hull No. 27, Seal, SS183, standa displacement, 1450 tons; keel laid M 25, 1936 launched August 25, 1937; d **livery date May, 1938.**

Hull No. 28, Skipjack, SS184, stan ard displacement, 1450 tons; keel la July 22, 1936; launching date Octob 23, 1937; delivery date July, 1938.

Hull No. 29, Sargo (SS188); stan ard displacement 1450 tons; keel la May 12, 1937; launching date June 1938; delivery date June, 1939.

Hull No. 30, Saury (SS189); stan ard displacement 1450 tons; keel la June 28, 1937; launching date July 3 1938; delivery date July, 1939.

(Page 66, please)

Dependable Insurance Since 1863

Fire · Automobile · Marine · Casualty · Fidelity · Surety

FIREMAN'S FUND GROUP

Fireman's Fund Insurance Company — Occidental Insurance Company
Home Fire & Marine Insurance Company
Fireman's Fund Indemnity Company — Occidental Indemnity Company

Strength Permanence Stability

New York · Chicago · SAN FRANCISCO · Boston · Atlanta

1937 Marine Safety Awards

The Accident Prevention Bureau the Pacific Coast American Shipowners' Associations, at a special luncheon meeting of the Executive Safety Committee of the Associations held at the Commercial Club on April 6, presented special awards consisting of certificates and flags to those member companies and vessels that attained special accident prevention records during the year 1937.

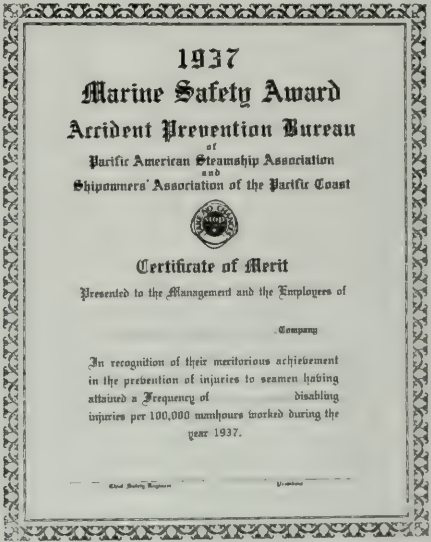
In addition to the regular members of the Associations' Executive Safety Committee (Capt. N. J. Kane, chairman), there were present as guests the chief operating executives of the member companies as well as the masters of the vessels in port that were eligible to receive awards.

Certificates of Merit were presented to the Dollar Steamship Lines, Matson Navigation Company, the Alaska Steamship Company, McCormick Steamship Company, and E. K. Wood Lumber Company. The Matson Navigation Company received special awards for both its passenger and freighter services and the McCormick Steamship Company received awards for both its freighter and steam schooner services. Names of the 87 vessels, entitled to awards, are shown below:

Passenger Vessels

No. in Fleet	No. Entitled To Award	Ships Entitled To Award
Alaska Steamship Company		
10	3	Yukon
		Mt. McKinley
		Northwestern

Above and at right, the safety award flag and the safety award certificate of merit for 1937.



1937
Marine Safety Award
Accident Prevention Bureau
of
Pacific American Steamship Association
and
Shipowners' Association of the Pacific Coast

Certificate of Merit

Presented to the Management and the Employers of

Company

In recognition of their meritorious achievement in the prevention of injuries to seamen having attained a Frequency of disabling injuries per 100,000 manhours worked during the year 1937.

Marine Insurance in All Phases — "All Risks" . . . Inland Marine . . . Ocean Marine

STANDARD MARINE INSURANCE COMPANY, LIMITED
NATIONAL UNION FIRE INSURANCE COMPANY
MERCANTILE INSURANCE COMPANY OF AMERICA

GEO. E. BILLINGS CO.

Pacific Coast General Agents—Richard J. Lutich, Marine Manager

GArfield 3646
308 California St.
SAN FRANCISCO

TRinity 1521
Spreckels Bldg.
LOS ANGELES

SEneca 1478
Colman Bldg.
SEATTLE

MARINE DEPARTMENT
AETNA INSURANCE CO.
QUEEN INSURANCE CO.
MARITIME INSURANCE CO., LTD.
FIDELITY PHENIX FIRE INS. CO.
Commercial Hull Dept.
AUTOMOBILE INS. CO.

Mathews & Livingston

Marine Underwriters

200 BUSH ST. SAN FRANCISCO
Offices at: Colman Bldg. - Seattle 111 West 7th St. - Los Angeles

Dollar Steamship Lines

14 9 Pres. Adams
Pres. Cleveland
Pres. Coolidge
Pres. Garfield
Pres. Hoover
Pres. Pierce
Pres. Polk
Pres. Taft
Pres. Wilson

Matson Navigation Company

4 3 Lurline
Matsonia
Monterey

— —

Total
28 15

Freighter Vessels

No. in Fleet | No. Entitled To Award | Ships Entitled To Award

Alaska Steamship Company

10 7 Derblay
Latouche
Curacao
Depere
Oduna
Tanana
Sutherland

American Hawaiian S.S. Co. (including O. & O. Navigation Company)

43 20 Golden Hind
Golden Sun
Alaskan
American
Arizonan
Arkansan
Californian
Carolinian
Dakotan
Indianan
Isthmian
Louisianan
Missourian
Nevadan
Oklahoman
Panaman
Texan
Virginian
Washingtonian
Golden Mountain

Matson Navigation Company and Subsidiaries

38 18 Golden Cross
Ewa
Makua
Golden Cloud
Golden Coast
Golden Kauri
Constance Chandler
Helen Whittier
Mauna Loa
Kahuku
Kailua
Lahaina
Diamond Head
Malama
Maliko
Mana
Manoa
Maunalei

McCormick Steamship Company

15 10 H. F. McCormick
Emergency Aid
Hollywood
S. M. Hauptman
West Cactus
West Camargo
West Cape
West Ira
West Ivis
West Notus

Swayne & Hoyt

13 7 Pt. Ancha
Pt. Caleta
Pt. Clear
Pt. Estero
Pt. Lobos
Pt. Salinas
Pt. Bonita

— —

Total
119 62

Steam Schooners

No. in Fleet | No. Entitled To Award | Ships Entitle To Award

E. K. Wood Lumber Co.

3 2 Olympic
Cascade

McCormick Steamship Company

12 8 Brookings
C. L. Wheeler
Munami
Peter Helms
Point San Pedr
Silverado
Wallingford
West Shipper

— —

Total
15 10

— —

Grand Total
162 87

Running Lights of Pacific Shipping

R. STANLEY DOLLAR

R. Stanley Dollar, president of Dollar Steamship Lines . . . entire business career on our Coast . . . boyhood in San Rafael. Who can think of Stanley Dollar without being reminded of his illustrious father, Captain Robert Dollar, Dean Emeritus of Pacific Ocean Trade!

Spectacular development of Dollar Line, the real pioneer in Coast commerce, specifically lumbering and steamshipping, from the little schooner Newsboy to the palatial President Coolidge and other liners of one of the greatest fleets in American shipping spells the meteoric career of our genial friend R. Stanley Dollar.

W. S. BURNETT

W. S. Burnett, vice president and general counsel, Hammond Lumber Company . . . a leader in the industry on the Pacific Coast. Attorney with general law practice in San Francisco . . . partner in the old firm of Page, McCutchen and Knight . . . till 1910—then with Hammond. Retired for some years in 1925, resuming as vice president in 1936. A native of Ireland, he greets you with true Irish hospitality. Going back to Erin soon, too, to revisit his family and some of the old places and faces. Hobbies . . . dogs and appreciation of music.

GEORGE E. SWETT, President of Geo. E. Swett & Company, Engineers. Came "from the rock-bound Coast of Maine to the peaceful shores of California" via Schenectady. His home town also gave "berth" to the picturesque sailing ship Phineas Pendleton; his grandsire of Brewer, Me., helped build her. Apprentice and student courses with G.E. and to their Seattle office in 1913. Later, with Allan Cunningham, pioneer winch designer. To S. F. in '20. Later one of the founders of Western Engineering Co., supply firm which now bears his name. One of the West Coast's best posted marine men, his firm has engine room installations innumerable. Can golf with the best of you . . . and make it interesting!

H. T. HAVISIDE

H. T. Haviside heads the Pacific Coast's largest fleet of salvage and derrick barges, also the ship supply house of Haviside Company. Harry's experience in salvage operations goes back 41 years. A long list of craft have been saved from disaster through the work of the Haviside salvage fleet. H. T. has two sons, Russell and Byron. Russell is manager of the ship chandlery division, while Byron is following in his father's footsteps in the salvage and heavy lifting operations of the historic firm. H. T. was Propeller Club president in 1934. His Barge No. 5 has figured in many waterfront celebrations. Countless Pacific Maritimers value his friendship and rank him an authority in his chosen field.

Propeller Club to Observe National Maritime Day

The 119th anniversary of National Maritime Day, which falls on May 22nd of each year, will be celebrated this year by a luncheon at the Commercial Club on May 24th, sponsored by the San Francisco Junior Chamber of Commerce, the Propeller Club of California, the Foreign Trade Association and the San Francisco Commercial Club.

National Maritime Day marks the observance of the departure of The Savannah, which on May 22, 1819, sailed from Savannah, Georgia, on the first successful transoceanic voyage under steam propulsion, thus making a material contribution to the advancement of ocean transportation.

For this occasion, good fortune makes possible the presentation of **J. Hugh Jackson,** director of the Dollar Steamship Lines; Dean of the Graduate School of Business of Leland Stanford University; and Acting Controller of Stanford University, and **Ralph W. Myers,** President of the Shipowners Association of the Pacific.

Both of these men are well qualified to speak on the subject of our merchant marine and will present much interesting and informative material.

Their ability as speakers has been demonstrated on previous occasions to such an extent that attendance at this luncheon is expected to exceed all previous marks. It is therefore advisable to make an early reservation at the Junior Chamber of Commerce to avoid last minute disappointments.

Members of the Propeller Club will duly receive official announcements of the event with details of how tickets may be obtained in advance. About four hundred of the port's leading marine figures will "come aboard" for this notable observance.

Ralph W. Myers, Propeller Club speaker
Maritime Day.

Thar She Blows!

All hands on Deck for the big Spring Banquet!

May 18th is your sailing date.

The good ship "Propeller Club" will be moored at the Marine Exchange for the event.

Fletcher Monson's shirtsleeve committee is making plans for breaking all records. From the moment you cross the plant till the last dog is hanged you will enjoy one thrill after another. The selection of the floor of 'Change for the merrymaking is a "natural."

Fletcher and his "seven dwarfs" are glorifying the historic meeting-place with elaborate shipboard effects . . . and you'll marvel at the transformation.

Refreshments are under the control of Mon Paulsen — a veritable Hercules on an assignment like this! Bashful Dick the Glissman . . . he of the muted voice . . . is corralling all the super talent north of Hollywood for a show supreme.

Russ Pratt is taking on all the other multitudinous details including the banquet specifications, the decorations, the reception job and the generating of the spotlight voltage.

Stanley Allen has set himself a goal of selling 250 tickets and tells us that seating reservations will be on the "first come, first served" order.

All of which sounds like Capt. Fletcher Monson is taking it easy. Don't you believe it, shipmates!

Looks like it will be a sell-out.

Luncheon Meetings Reviewed

Chairman of the Day Capt. Wi liam Fisher, supervising inspector the 7th District in San Francisco, i troduced guest-speaker R. S. Field the April 12th meeting.

Mr. Field, director of the U. Bureau of Marine Inspection an Navigation, gave us an interestin sidelight on the operations of h department.

Capt. Fisher's introduction was superb one.

APRIL 26

Willis Camp, traffic representati of United Air Lines was introduce by Bryant O'Connor who assured t speaker that his message would fa on receptive ears . . . as Propell Club members are exceptional their air traveling records. Hug Brown was named as our example- upon his return from a South Ame ican air voyage which logged 17,0 miles. (By the way, ask Hugh show you the remarkable panoram and close-up photos he took. They' excellent!)

Willis Camp proved to be an e gaging speaker and did a good j in convincing his audience of t safety, comfort, and speed of a travel. "Coast to Coast by Plane" one of the better commercial movi and its projection to amplify t speaker's remarks was grand ente tainment.

Get These BIG Advantages

CASE WEATHER DECK COVERING

- A new, non-slip surface that is a revelation in safety decking.
- Protects steel decks against rust . . . wood decks against weather and wear . . . both against slipping.
- Stops leaks in both caulked decks and superstructures.
- Withstands all kinds of weather from tropic heat to arctic cold.
- Easily and quickly applied . . . average boat deck covered in 3 or 4 days . . . ready for service immediately.
- Costs substantially less than canvas to install.
- Requires no painting . . . practically eliminates maintenance costs.
- Thoroughly waterproof and fire resistant.
- Permanent . . . original applications have given over 12 years of service.
- Used by big fleet owners on many types of vessels.

Application services available through franchised contractors in Seattle, Portland, San Francisco, Norfolk, and New York. For complete information, call or write—

L. S. CASE Co.
SHIP SERVICING

L.S. CASE CO.

Seventh and Daggett Streets
SAN FRANCISCO
HEmlock 7821

Historic Fish Hatchery Closed

In 1872 Professor Spencer F. Baird, signed by the Smithsonian Institu on to organize the new U. S. Com ission of Fisheries, sent Livingston one, a pioneer fish culturist, to istant" California. The purpose of e trip was to apply the fast devel ing art of fish culture to the per tuation of the California or chin k salmon. As a result of Mr. one's trip he established after me arduous field work a small egg llecting station and hatchery on e McLoud River in the upper Sac mento Valley. This came to be own as the Baird, California, Hat ery.

The reason for citing these histori l items is the fact that the Baird ation has been finally closed down ter operating continuously roughout the entire period of Fed al fish cultural work.

This closure after 65 years of useful activity is necessitated by several causes. Primarily, the new Central Valley Irrigation and Power Project will virtually flood the station out and render its further operation impossible. Furthermore, during recent years the changed conditions have resulted in a depletion of the run of salmon and inability to secure eggs. The salmon have been diverted to other streams and the principal activities have been confined to sub-stations located at Mill Creek and Battle Creek in that territory. Several years ago volcanic activity in that region resulted in slides which precipitated a tremendous amount of silt into the McLoud River and seriously affected the hatchery water supply.

By recently promulgated executive order the Baird hatchery has been turned over to the jurisdiction of the Bureau of Reclamation.

Frank Grove Company Adds to Staff

Frank Groves, manager of the Frank Groves Company of San Francisco and Oakland, informs us that Harold Waldron is now associated with the organization as office manager in San Francisco. Waldron is well and favorably known through his connections with the marine and industrial markets in this territory during the past ten years.

Officers of the Groves firm are: Frank Groves; R. H. "Bob" Cartier, former marine engineer in Pacific Coast vessels; and Harry W. Logan, who is manager of the organization's Oakland offices.

Products represented by this firm are: American Asphalt Paint Company, The V. D. Anderson Company, Botfield Refractories Company, Crane Packing Company, Flexitallic Gasket Company, Gemlen Chemical Company, Key Company, Nedmac Products, Py-Lubro Company, Inc., and Thermoid Rubber Company.

Pacific Personalities

HARVEY M. HUFF

A recent Pacific Coast appointment was that of Harvey M. Huff, formerly connected with the United Fruit Company in San Francisco, who has been given the post of Pacific Coast agent for the Aluminum Line of New Orleans. Huff is well known in local shipping circles, and will be in charge here of the three services out of New Orleans.

CAPT. R. W. DEMPWOLF

Effective on June 1, Capt. R. W. Dempwolf, commander of the Seattle division of the United States Coast Guard, has been promoted commander of the New York division and captain of the port of New York. He has been stationed at Seattle since 1934, first coming to that port in 1928 as commander of the cutter Chelan, then on her shakedown cruise.

FRED WARNER

The Harbor Board of San Pedro recently instructed Port Manager Eldridge to request the Civil Service Commission to hold an examination for appointment of an additional municipal pilot, with the indication of retirement on July 1 of Chief Port Pilot Fred Warner, who has reached statutory retirement age, that is, 70 years.

Capt. Warner is a veteran of the gold rush days in Alaska and has seen nearly sixty years of service in sail and steam in the American merchant marine. He hopes that retirement may be avoided, however, as he would like to continue in his post.

J. W. OKEY

At Los Angeles, Walter Wilkinson, manager for Interocean Steamship Corporation, recently announced the addition of J. W. Okey to the freight staff as district freight agent. Okey will specialize in solicitation for the Weyerhaeuser Line's Pacific Coast Direct Line intercoastal service. He is a very well known street man in the industry, formerly having been with Luckenbach Line and Grace Line. Most recently he was connected with the Panama Pacific Line.

ANDREW CARMICHAEL

Announcement has been made by the National Revenue Department of the appointment of Andrew Carmichael as Collector of Customs and Excise for the Port of Vancouver.

G. A. MacMILLAN

Succeeding Thomas Louden, who retired two months ago, G. A. MacMillan has been appointed superintendent of the Canadian National Steamships in the Alaskan service. Announcement came from W. T. Moodie, general superintendent of Canadian National Railway & Steamships, on the Pacific Coast.

MacMillan joined the company in 1919 at Prince Rupert, where he has been manager of the Prince Rupert Drydock & Engineering Company since 1923, the latter being related to Canadian National Steamships.

GEORGE TALMAGE

Announcement was recently made of the resignation of George Talmage, freight traffic manager of Panama Pacific Line, as chairman of the administration and finance committee of the Intercoastal Steamship Freight Association. The other members of the committee are H. W. Warley, O. P. Caldwell and R. A. Nicol.

JOHN LOCK

Formerly purser of the Panama Pacific liner Pennsylvania, John Lock returned to the transatlantic run when he sailed as purser on the President Harding last month, which he left in the middle of 1936 to go into intercoastal service. His assistant on the Pennsylvania, Edward C. Laflen, also transferred to the Harding, as assistant purser.

A. E. Powell, who exchanged posts with Lock in 1936, after six years of service on the Pennsylvania, returned to that ship as a member of the staff.

PAUL CISKO

Succeeding A. H. Clifford, who retired a short time ago, Paul Cisko has been appointed as deputy collector of customs in charge of the marine division at the Customs House, San Francisco. He has been with the service since 1925, prior to entering the customs service being with the Coast Patrol and the Prohibition Department.

Henry E. Frick.

U. S. Maritime Commission Appointe

The United States Maritime Commission today announced the appointment of Henry E. Frick as Chie of the Construction and Inspectio Section of the Commission.

Mr. Frick was born in Baltimore Md. From 1896 to 1901, he was employed by the Standard Shipbuildin Company of Messrs. Harland an Wolff of Belfast, Ireland, receivin special training in ship constructio and marine engineering. He was supervisor of hull construction work fo the Maryland Steel Company o Sparrows Point, Md., from 1901-190 From 1904-1917, he worked for th Fore River Shipbuilding Compan now the Fore River Plant of th Bethlehem Shipbuilding Corporatio of New York City, as Superintende and Assistant Manager. He serve with the U. S. Shipping Board Emergency Fleet Corporation from 191 to 1920 at Bristol, Pa. and at Ho Island, and as District Manager the Northern Pacific District, wit headquarters at Seattle, Wash. also served with the Shipping Boa in Philadelphia as Manager of Construction and Assistant to Vice Pre ident J. L. Ackerson; and from 192 1924 was European Manager Maintenance and Repair for t Board in London, England. Fro 1924-1935, Mr. Frick was Vice Pres dent and General Manager of t Export Steamship Corporation, a during this time supervised the co struction of four Excalibur-ty steamers, popularly known as t "Four Aces". During 1936 and 19 he was associated with Phelps Br & Co., Inc., of New York, steams brokers and operators.

WELDED STEEL

BARGES and DUMP SCOWS

Save in First Cost and Upkeep!

Welded or Riveted Hull Construction
Ship Repairing · Metal Spray Service

We have a completely equipped Plate Shop, Machine Shop and Outfitting Dock in the Oakland Outer Harbor

PACIFIC COAST ENGINEERING CO.

Phone HIgate 1322 — Outer Harbor — Oakland

Ready!

At all Pacific Ports

FEDERAL PAINT and FEDERAL SERVICE

for
Tankers
Ocean Going Freighters
Intercoastal Passenger Liners
Sailing Vessels
Ferryboats
Trans-Pacific Express Steamships
Pleasure Craft
Work Boats
Schooners

The Federal Composition & Paint Co., Inc.

33 Rector Street, New York, N.Y.

ON THE PACIFIC COAST:

SEATTLE, WASHINGTON
A. T. B. Shiels
108 West Lee Street

PORTLAND, OREGON
Chalmers Shipping Co.
Board of Trade Building

SAN FRANCISCO, CALIF.
Pillsbury & Curtis
310 Sansome St. KEarny 3302-3

SAN PEDRO, CALIF.
Robert S. Gardner
P. O. Box "C"

Agents and Stocks in all the Principal Ports

U. S. Naval Reserve Extension

Virtually the entire purser's department of the United States Lines will soon be staff officers in the United States Naval Reserve, according to **A. J. McCarthy,** vice president in charge of operations, who revealed recently that all of the lines' pursers and assistant pursers had already made application for commissions in the Supply Corps under the Navy Department's new policy of accepting applications from qualified members of this department of the Merchant Marine.

For many years members of the purser's department on American ships have been keenly interested in obtaining commissioned rank in the Naval Reserve similar to that held by many of their brother officers in the deck and engine departments of merchant vessels. Pursers of United States Lines ships responded promptly, therefore, to the announcement last November that the Paymaster General would consider applications from pursers of American steamship lines for commissions in the Supply Corps of the Naval Reserve if they were qualified by experience, education, personality, initiative, adaptability and physical fitness.

The first member of the pursers staff of any American steamship line to become an officer in the U. S. Naval Reserve under the new policy was **August Falkenbach,** who was recently commissioned a lieutenant commander in the Supply Corps by virtue of his position as paymaster of the United States Lines and head of the purser's department. **J. R. Pickering,** assistant paymaster, was commissioned as a lieutenant about the same time.

On recommendation from **Captain William H. Lee,** assistant general manager of the United States Lines, who is a commander in the Merchant Marine Naval Reserve and its second ranking officer, all pursers and assistant pursers of the line have by now made application for commissions and a number have already received them.

All commanders and senior deck and engine officers of the United States Lines' services and a majority of the junior officers are line officers of the Naval Reserve. **Commodore Randall** of the United States liner Manhattan, who now holds the rank of captain, is the highest ranking officer. His commission dates from May, 1919, as does that of **Captain Lee,** second ranking Naval Reserve officer. Members of the company's pier staff who are officers in the Naval Reserve include: **Captain Schuyler F. Cumings,** marine superintendent; **Oscar Olson,** superintendent engineer; and **Benjamin A. Wilson,** assistant superintendent engineer.

Shipbuilders Election

The Annual Meeting of the members of the National Council of American Shipbuilders was held at the Whitehall Club, New York City, on April 21, 1938. About seventy were present.

The officers of the Council as follows were reelected:

Mr. H. Gerrish Smith, President.
Mr. Roger Williams, Vice President.
Mr. C. C. Knerr, Secretary-Treasurer.

The following directors were elected for a term of two years expiring April, 1940:

Mr. W. S. Newell, President, Bath Iron Works Corporation.
Mr. D. R. Dunlap, President, Alabama Dry Dock & Shipbuilding Co.
Mr. W. H. Gerhauser, President, American Ship Building Company.
Mr. C. Stewart Lee, V. P., The Pusey & Jones Corporation.
Mr. L. Y. Spear, V. P., Electric Boat Company.
Mr. J. D. Reilly, President, Todd Shipyards Corporation.
Mr. D. W. Niven, Mgr., Federal & Marine Dept., General Electric Co.
Mr. O. B. Whitaker, Mgr., Marine Department, Sperry Gyroscope Co.
Mr. H. L. Watson, Exec. V. P., De Laval Steam Turbine Co.
Mr. F. B. Devlin, President & Counsel, New York & New Jersey Dry Dock Ass'n (1 year term).

The other directors of the National Council whose terms expire March 31, 1939 are:

Mr. S. W. Wakeman, V. P., Bethlehen Shipbuilding Corp., Ltd.
Mr. Robert Haig, V. P., Sun Shipbuilding & Dry Dock Co.
Mr. H. L. Ferguson, President, Newport News Shipbuilding and Dr Dock Co.
Mr. L. H. Korndorff, President, Federal Shipbuilding & Dry Dock Co.
Mr. G. H. French, President, Th Maryland Dry Dock Co.
Mr. C. W. Middleton, V. P., The Babcock & Wilcox Co.
Mr. R. B. Mildon, V. P., Westinghouse Electric & Mfg. Co.

Shark Can't Take Fiji Kiss

Rev. A. J. Laplante, S.M., a Catholic missionary to the Fiji Islands, i responsible for this unusual shar story, according to the United Press

"Twice a year the Fiji native spend days in preparation for thei semi-annual fishing expedition. The build a huge tennis-like net of wove matting, about 300 feet long and 1 feet wide.

"It is stretched across a shark-in fested river by men and women wh work shoulder deep in the water an it is held there until the male members of the tribe drive the sharks an other fish into the encircling ne Then it is slowly pulled toward shor and here takes place a phenomeno I cannot explain.

"Six picked men of the tribe wac into the water barehanded, gra sharks three and four feet long t the tail, lift them out of the wate and kiss them on their upturned be lies. The sharks stop wiggling i stantly when kissed. The natives la them down side by side on the beac and they never move again."

His motion pictures bear out h story completely.

R. E. BORCHGREVINCK

A recent arrival in San Francis was R. E. Borchgrevinck, who can from Sweden, where he has been du ing the past year following his resi nation as manager of the Portlan Waterfront Employers in Marc 1937. He has been connected wi Grace Line for many years, and w en route to Vancouver, B. C., whe he will take charge of the Johns Line agency.

THE LABEL
"AMERICAN MARINE PAINT"
SIGNIFIES QUALITY

FOR ALL MARINE COATINGS

FOR BOTTOMS { GERMICIDE COMPOSITIONS } FOR STEEL HULLS
CAPE COD COPPER PAINTS } FOR WOODEN HULLS

FOR DECK AND ENGINE ROOM REQUIREMENTS { A proper and efficient coating for all surfaces including such outstanding leaders as HI-TEX ENAMELS and ALL-PROOF VARNISH. Both built for marine use—they are durable—fast drying—weather resisting and noted for their retention of gloss and color.

AMERICAN MARINE PAINT CO.
SEATTLE SAN FRANCISCO WILMINGTON

TOUMEY ELECTRIC & ENGINEERING CO.

Representing
BENDIX MARINE PRODUCTS CO.
Successors to
CHAS. CORY CORPORATION
Signaling, Communicating and Lighting Equipment
PNEUMERCATOR CORPORATION (New York)
Gauges: Liquid Level, Ships Draft, Pressure, Boiler Water Level
PLANT MILLS DIRECTION INDICATOR AND ENGINEER'S ALARM

MARINE AND INDUSTRIAL ELECTRIC INSTALLATIONS . . . MARINE ELECTRIC FIXTURES . . . SUPPLIES AND REPAIRS . . . ARMATURE WINDING . . . . SEARCHLIGHT PROJECTORS . . . . SOUND POWERED TELEPHONES . . . . FIRE ALARM SYSTEMS

GArfield 8102 SAN FRANCISCO 115-117 Steuart Street

SS LURLINE · SS MARIPOSA · SS MONTEREY · SS MATSONIA

Matson Line to Hawaii

NEW ZEALAND · AUSTRALIA via Samoa · Fiji

★

Hawaii's blue skies . . . scampering surf . . . unfettered breezes . . . are all irresistible. Frequent sailings from San Francisco and Los Angeles.

Hotel reservations at Royal Hawaiian or Moana at Waikiki are made at the same time as steamer bookings—a distinct convenience to Matson travelers.

Fares *(each way): California to Honolulu*
FIRST CLASS *from* $125 CABIN CLASS *from* $85

MATSON SOUTH PACIFIC CRUISES to New Zealand and Australia. *Personally-escorted,* every 4 weeks. 48 days; 17,000 miles; 12 shore excursions. All-inclusive-cost, First Class, complete cruise, from $650 *for certain Summer sailings.*

SHIPPERS: The *Lurline* and *Matsonia* provide swift freight service to Hawaii, with modern refrigeration facilities. The *Mariposa* and *Monterey* continue to New Zealand and Australia via Samoa and Fiji. Also regular and frequent freighter service from Pacific Coast ports.

Details from all Travel Agents or:
Matson Line - Oceanic Line
San Francisco · Los Angeles · Seattle · San Diego · Portland

FOR FAST, DEPENDABLE SERVICE TO *ALL* PARTS OF THE WORLD, SHIP

French Line

FAMOUS FOR 74 YEARS

Moroccan Service · Mediterranean Service · North Pacific Coast Service · West Indies, Cuba and South America Service · Mexico, Cuba, Spain Service.

•

General Agents for Messageries Maritimes, Chargeurs Reunis and Compagnie Sud-Atlantique, Air-France.

New York to England, France, and thus to all Europe:
NORMANDIE
(World's Largest and Fastest Ship)
ILE DE FRANCE
PARIS
CHAMPLAIN
LAFAYETTE

FRENCH LINE
Main Office: 610 Fifth Avenue
(Rockefeller Center)
New York
Freight Office:
19 State Street, New York

A Weather Decking
That Keeps Out The Weathe

Weather decks, or the decks exposed to the weather on seagoing ships, are exposed to a tremendous battering when the old ocean gets to acting up. Many men of imagination traveling at sea have marveled that any fabricated construction could stand the strain of this hammering attack by the elements. A notable example is Charles Dickens, who thus describes in his "American Notes" the experience of a steamer in a winter storm on the North Atlantic:

"A heavy gale of wind, which came slowly up at sunset, raged with gradually increasing fury until morning. The laboring of the ship in the troubled sea on this night I shall never forget.

"The agitation of a steam vessel on a bad winter's night on the wild ocean, it is impossible for the most vivid imagination to conceive.

"To say that she is flung down on her side in the waves with her masts dipping into them, and that springing up again she rolls over on the other side until a heavy sea strikes her with the noise of a hundred great guns and hurls her back —that she staggers, and shivers and stops as though stunned and then with a violent throbbing at her heart darts onward like a monster goaded into madness, only to be beaten down and battered and crushed and leaped on by the angry sea—that thunder, lightning, hail and rain and wind are all in fierce contention for the mastery — that every plank has its groan, every nail its shriek, and every drop of water in the great ocean its howling voice—is nothing. To say that all is grand, and all is appalling, and all is horrible in the last degree, is nothing. Words cannot express it. Thoughts cannot convey it. Only a dream can call it up again in all its fury, rage, and passion.

"When I literally 'tumbled up' on deck at noon the next day, ocean and sky were all of one dull heavy uniform lead color, and the deck was a scene of desolation. In the gale of last night the life boat had been crushed by one blow of the sea like a walnut shell; and there it hung dangling in the air, a mere faggot of crazy boards. The planking of the paddle boxes had been torn sheer away. The wheels were exposed and bare and they whirled and dashed their spray along the deck at random. Chimney, white with crusted salt; top masts struck; rigging all knotted, tangled, wet and drooping; a gloomier picture it would be hard to find."

Steamers are better built today than they were in the days of the old side wheelers, but it is still a fairly common experience on shipboard to have "seas come over" that "smash the bridge", tear loose all portable gear, and generally work havoc on weather decks and all exposed superstructures.

When a cargo vessel or a passenger liner is plowing into a "bit of a sea and a head wind" her weather decks may at any moment be subjected to the impact of hundreds of tons of water, and the problem of keeping any decks water tight, and steel decks not only water tight but free from the ravages of corrosion, is one of the toughest assignments given to the ship maintenance expert.

For more than eleven years the L. S. Case Company of San Francisco has made the solution of this problem a specialty. This firm owns a patented process for applying to the weather decks of ships a sheet decking manufactured to their specifications and guaranteed to be wate proof. Through eleven years of serv ice to an increasingly enlarged cl entele on many Pacific Coast fleet the L. S. Case Company has wo the confidence of Pacific Coast shi owners and operators.

During all of this time they ha carried on practical research wo for the betterment of Case Weath Decking and many improvemen have resulted from this policy.

Notable among these improvemen is the addition of a non-slip abrasi surface which greatly adds to th safety of the crew in deck operation This feature alone might save man times the cost of the decking throug the reduction of damage claims an the possibilities of lower premiu for indemnity insurance.

The demand for Case Weath Decking Service has now becon Coast wide and the L. S. Case Con pany is represented by licensed a plicators in Seattle, Wash., Portlan Ore., and Los Angeles, Calif.

This Weather Decking is manufa tured by the Paraffine Compani Inc. to special specifications pr pared by the L. S. Case Company. Th advantages claimed for its use ar

(1) Water tightness.

(2) Preservation of steel or wo decks.

(3) Long wear.

(4) Non-slip surface.

(5) Neat appearance.

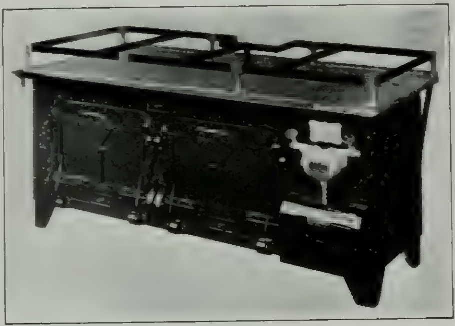
Case weather decking on a Matson cargo carrier.

HOW DO I KEEP SUCH A SWELL GLOSS ON MY BOAT? WITH THE TOUGHEST SPAR VARNISH I'VE EVER TRIED — **FULLER'S** MARINE FULLERSPAR
FULLER *Marine* FINISHES
A complete line of paints and varnishes for every marine need.

Since 1857

Montague "Rotair"

Steel Ship Ranges



"Rotair" Range body is 14 gauge steel; the Ovens 7 gauge steel.
2 inch magnesia insulation throughout.
All riveted construction.
The tops are of gray iron castings.

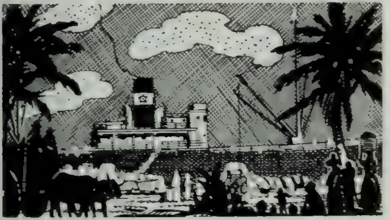
"In Service On All Oceans"

We build and install ranges to meet your requirements!

The MONTAGUE CO.

Hemlock 6700 SAN FRANCISCO 1131 Mission St.

Low Cost Cruises



To the WEST INDIES and SOUTH AMERICA

Poking in and out of strange ports, our ships never have a set schedule; while certain ports, as indicated on our chart, are sure to be covered, many stops are dependent on freight offerings and the itinerary will vary time and again. This adds a mystery tang to your trip.

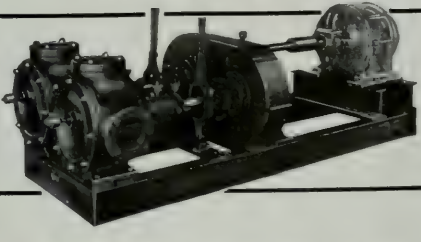
Cargo steamers with limited number of passenger accommodations—21,000 miles of leisurely cruising—more than 15 ports visited—100 days of relaxation and diversion for only $475 (from California ports.)

Write for descriptive folders to . . .

McCORMICK STEAMSHIP COMPANY

461 Market St., San Francisco
DO 2561

WE WOULD LIKE TO SELL YOU A PUMP THAT YOU CAN FORGET ABOUT!



Today Viking rates "tops" in the Marine Field. It has proved itself the pump that requires less attention—less expense to operate. Viking Marine models are compact, easily installed, self-priming, and handle all types of liquids regardless of viscosity. Every pump need, from fire and bilge models to extra capacity Marine Terminal and Tanker Units, are shown in Viking's Special Marine Bulletin. Write for your copy today.

2038 S. Santa Fe Avenue - Los Angeles, Calif.

PACIFIC COAST DISTRIBUTORS:

De Laval Pacific Company
61 Beale St. - San Francisco, Calif.

VIKING PUMP CO.
CEDAR FALLS, IOWA.

Caterpillar Announces Marine Diesel Engine

In response to continuous requests from the marine field, Caterpillar Tractor Co. has added two regular marine models to its diesel engine line.

Since the company introduced its first diesel power unit several years ago, there has been a strong desire by workboat owners to power their vessels with these dependable engines, and the result of this has been the selling of quite a number of engines to individual purchasers who are owners of tugs and fishing boats. Due to this demand, the company has made these two standard models available.

Both marine engines are six-cylinder, 900 r.p.m. units. The D13,000 model has a bore and stroke of 5¾" x 8", and develops 100 horsepower. The D11,000 model, with a bore of 5¼" and a stroke of 8", develops 80 horsepower.

The company believes that these are the most complete marine diesel units available from one source to the trade. These engines, with reverse gear, are ready for operation when but five connections have been made. It is only necessary to connect exhaust to atmosphere, sea water suction to pump, heat exchanger outlet to overboard discharge, fuel oil line to main storage tank, and to align the thrust bearing shaft and connect it with the propeller shaft.

Certain additional equipment, such as either Joes or Twin-Disc model marine reversing clutches and reduction gears in several speed ratios, electric motor starting either singly or in addition to the standard "Caterpillar" gasoline starting engine, and a front power take-off are available.

The "Caterpillar" engines are medium speed, medium weight engines designed and rated for continuous duty. They are ideal for the workboat field, including ferries, tugs, towboats, fishing vessels, cargo vessels and dispatch vessels.

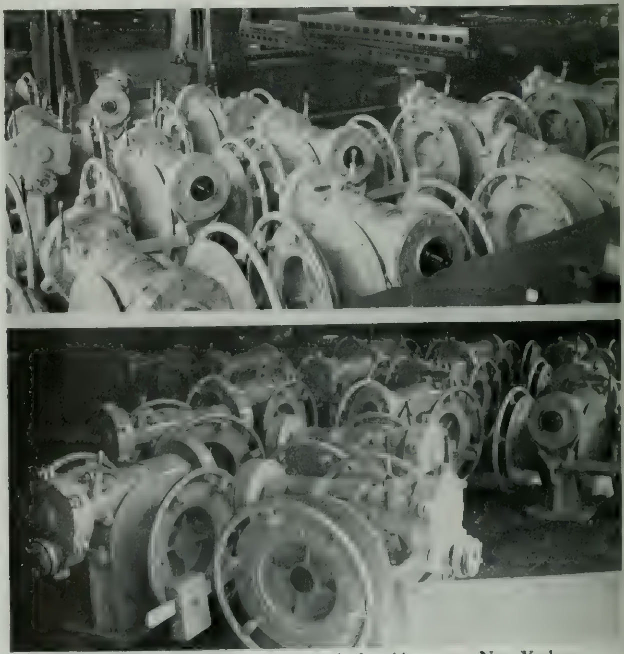
Genco Life Boat Winch

The Genco Lifeboat Winch, designed and manufactured by the General Engineering & Dry Dock Company of San Francisco, is attracting the attention of many shipowners through its ability and its compactness of design.

During the past month two carloads of Genco Lifeboat Winches were shipped to distant points. This equipment was purchased by the Northland Transportation Company of Seattle, Washington, and the Moore-McCormack Company of New York City.

Winches for the Northland ships will be installed under the supervision of Carl J. Nordstrom, consulting naval architect of Seattle. Work will be done by a Puget Sound shipyard.

C. C. Galbraith & Son, Inc., 99 Park Place, New York City, have contracted for complete installation of the Genco Winches on the Moore-McCormack ships. These winches are power driven and arranged for tandem drive, with motors and control equipment. All blocks, wire rope falls, and electric wiring are included in the contract. This company is the Eastern sales representative for Genco Winches.



A carload of Genco winches ready for shipment to New York.

Fel-Pro Flexible Metallic Packing

The Felt Products Mfg. Co., of Chicago, Illinois, have recently appointed the Frank Groves Company of San Francisco and Oakland, California, as the Pacific Coast representatives of their Metallic Packing Division.

Fel-Pro flexible metallic packing is of unique multiple strand design, employing a number of small cores individually armored with foil and assembled through a special spiraling process by Felt Products equipment so that each strand contacts the packed member at a 60° angle.

This design allows for extreme resiliency; definitely controls packing density; eliminates core shifting.

EUGENE V. WINTER CO.

●

Representing

NATIONAL TRANSIT PUMP & MACHINE CO.
Reciprocating and rotary pumps for marine, industrial and refinery service.

CONDENSER SERVICE & ENGINEERING CO., INC.
Heat Exchanger Specialists.

REILLY FEED WATER COILS
Carried in San Francisco stock.

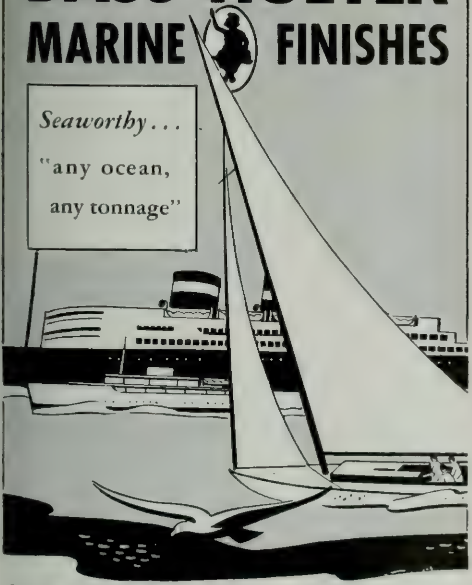
THE MAXIM SILENCER COMPANY
All types of silencers and spark arresters for gasoline and diesel engines, and air compressors.

RED HAND COMPOSITIONS CO., INC.
Marine Bottom Paints.

KOPPERS CO.—AMERICAN HAMMERED PISTON RING DIVISION
Piston rings for gasoline, diesel and steam engines, air compressors. Diameters from 1 inch to 120 inches—separately cast.

EUGENE V. WINTER CO.
19 Main Street, San Francisco, Calif.
Phone: DOuglas 2714

BASS-HUETER
MARINE FINISHES



Seaworthy . . .
"any ocean,
any tonnage"

ASK THE NATIONAL LEAD MAN!

IN SHOWERS . . .
IN GALLEYS . . .

Alundum Tile Floors,
Non-slip When Wet

FOR every place aboard ship where there is a slipping hazard there is a suitable Norton Floors product—Alundum Tiles and Aggregates. Each product provides dependable walking safety—a surface that will not wear slippery—whose effectiveness is not lessened by water.

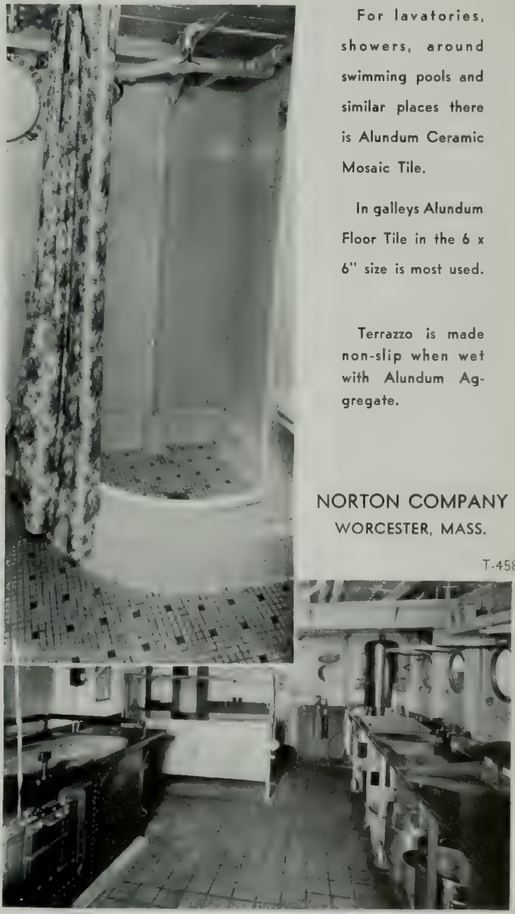
For lavatories, showers, around swimming pools and similar places there is Alundum Ceramic Mosaic Tile.

In galleys Alundum Floor Tile in the 6 x 6" size is most used.

Terrazzo is made non-slip when wet with Alundum Aggregate.

NORTON COMPANY
WORCESTER, MASS.

T-458



NORTON FLOORS
ALUNDUM TILES—TREADS—AGGREGATES

A Definition of Metal Spray

By A. V. Gruber

Metal Spray Division, Condenser Service and Engineering Co.

The metal sprayer consists of a unit which entails oxy-acetylene or oxy-hydrogen or other combustible gas flame; or a unit constructed to use an electric arc process, and compressed air or inert gas, an air turbine or electric motor or a Venturi system. The air turbine or electric motor unit drives a train of gears used to feed the material in wire form to be sprayed into the oxy-acetylene, oxy-hydrogen or other combustible gas flame (or to feed two wires together at a continuous rate, sufficient to produce an arc in the electric arc system which melts the wire) where it is melted and atomized and blown onto the surface which is to be built up or sprayed. The Venturi system uses the material in powder form and conducts it by means of compressed air, inert gases, or combustible gases into the oxy-acetylene or oxy-hydrogen or other combustible gas flame and blows it on the surface which is to be built up or sprayed.

In order to be proficient in metal spraying, the operator must have a thorough knowledge of the flame characteristics of combustible gases, compressed gases and air, and proper surface preparations of the surfaces or areas to be sprayed with molten metals.

The surface preparation consists of a premachining and/or sandblasting operation, or the use of a roughening or abrading tool. The nature of surface preparation by sandblasting for metal spray to obtain maximum adherence of the sprayed metal to the surface is peculiar in itself, and is not to be confused with ordinary type of sandblasting for merely cleaning or preparation for painting.

The finishing of sprayed metal surfaces also differs from ordinary machine shop practice in that special tools and grinding wheels must be used with the various types of metals and finished at certain rates of speeds, feeds and cuts.

The process is successfully used for building up worn or new mechanical, rotating, sliding or reciprocating equipment, for protecting surfaces with the more noble metals to resist acid, alkali, gas, heat and other corrosion or abrasion, for effecting decorative surfaces on practically any type of material such as steel, wood, paper, cloth, glass, plaster-paris and others, and for producing electrical conducting surfaces on dielectric materials.

To become expert at metal spraying the operator must start from the ground up, become thoroughly familiar with and master each phase of the work.

The time and test requirements to become a first-rate metal sprayer are necessarily rigid, since the success of this process depends entirely on the skill of the operators.

It is important to know the limitations of metal spray. It is not a cure for all evils.

Arc Welding Machine Goes Fishing

When an arc welding machine goes on a fishing trip, it's news—particularly when it goes tuna fishing south of the Equator. That is exactly what a late model 200 ampere General Electric arc welding machine is going to do—going fishing and keep the important refrigerating machinery in working condition on the good tuna clipper Liberty. But it isn't going merely to keep things cool in the hot equatorial waters of the great Pacific Ocean. Don Byrd, chief engineer of the Liberty, visualizes many emergencies which would be taken care of promptly by this modern "Chips" — the General Electric arc welder.

The Liberty has a sizable appetite for fish—her holds will take 300 tons of them. She can make 10 knots and continue to do so—without stopping at a filling station—for a cruising range of 8000 miles. This vessel was built by the Campbell Machine Company of San Diego, California, for Capt. Frank Gonsalves, Jr., and his six co-workers. Its cost was approximately $150,000; it has a length of 128 feet; beam, 28 feet 6 inches; and depth, 13 feet 6 inches. It is equipped with a six-cylinder 450 H.P. Union diesel engine with super-charging equipment increasing its horsepower to 540 H.P. at 255 r.p.m. It carries two four-cylinder Union diesel auxiliary engines of 100 H.P. each directly connected to a 75 KW A.C. generator.

Vortex Dust Catchers for Largest American Liner

Of outstanding interest to the traveling public is the fact that the new United States Lines' vessel to replace the Leviathan will be equipped with Vortex Dust Catchers, one for each boiler. As a result, when she goes into service with the Manhattan and the Washington, passengers will enjoy decks and recreational spaces completely free from annoying cinders and greasy stack carbon.

From the standpoint of the owners, this action eliminates passenger complaints and petty claims for clothing soiled or damaged by stack solids. It also materially reduces deck maintenance and painting expense in addition to eliminating fire risk to awnings, boat covers, and pier property.

In response to an ever increasing public demand and preference for clean ships and sports decks, the luxury liners and cruise ships of leading maritime nations have been equipped with Vortex Dust Catchers. It is fitting and proper, therefore, that this newest, largest and fastest American ship take her competitive place in the North Atlantic trade similarly protected.

COMFORT •

New HOTEL CLARK

Fifth and Hill in Downtown

LOS ANGELES

Rooms 5 5 5 Baths

from $2.50 PER DAY

Visit the "TAVERN"

a quiet retreat—tucked away in the rear of the lobby.

Convenience is another offering of this hotel. Whether on business or pleasure bent, the Hotel Clark makes an ideal "base of operations," as well as a restful "billet" at the end of the day's "campaign." Good Food naturally. And moderate charges, as well as for room accommodations, give final significance to assuring word—COMFORT.

Personal Management of P. G. B. MORRISS

For a Memorable Visit to New York

Enjoy living at the Savoy-Plaza with its spacious . . . tastefully furnished rooms . . . outstanding service . . . delicious cuisine . . . and exciting entertainment facilities. With Central Park at its door and the fine shops, theatres and subway nearby, this hotel is convenient to all parts of the city. The Savoy-Plaza awaits your arrival to present you with all those attendant harmonies of fine living that have made this hotel the favorite of New Yorkers.

For information and reservations communicate with our California Representative,

GLEN W. FAWCETT
510 W. 6th St., Los Angeles—Trinity 3671
49 Geary St., San Francisco—Sutter 4464

HENRY A. ROST, *Managing Director*
GEORGE SUTER, *Resident Manager*

SAVOY-PLAZA
FIFTH AVENUE
58TH TO 59TH STS.
NEW YORK

Hull No. 31, Spearfish (SS190); standard displacement 1450 tons; keel laying date September 9, 1937, launching date October 27, 1938; delivery date September, 1939.

Hull No. 33, Seadragon (SS194); 1450 tons; keel laying date April 18, 1938; delivery date December, 1939.

Hull No. 34, Sealion (SS195); 1450 tons; keel laying date June 15, 1938; delivery date February 1940.

THE FEDERAL SHIPBUILDING AND DRYDOCK COMPANY

Kearny, N. J.

NEW CONSTRUCTION:

Three destroyers, **DD397 Benham, DD398 Ellet and DD399 Lang, estimated launching April 16,** June and August 1938; keels laid DD397, September 1, 1936; DD398, December 3, 1936; DD-399, April 5, 1937.

One 12,800-ton tanker for the Standard Oil Company of New Jersey; 450′ x 66′6″ x 34′6″; Isherwood Arcform design of hull form and longitudinal hull framing; keel laid August 16, 1937; **launching date March 19, 1938; delivered March 24, 1938.**

Two destroyers, DD411 Anderson and DD412 Hammann; keels laid November 15, 1937 and January 17, 1938, respectively.

Hulls Nos. 149-150, two 12,900 ton tankers for Pan American Petroleum & Transport Co.; 440′ B.P. x 66′ 6′ x 34′ 6″, 450′ OA.; Isherwood Arcform design of hull form and longitudinal hull framing. Keels laid November 15, 1937 and January 10, 1938 respectively; **estimated launching** dates **May** and July, 1938;; estimated completion date October, 1938.

Hulls Nos. 151, 152, and 153, three tankers for Standard Oil Co. of New Jersey.

INGALLS IRON WORKS CO.

Birmingham, Ala.

NEW CONSTRUCTION: **One 15 ton derrick boat hull** for U.S.E.D.

Ten hopper type cargo barges 280′ x 48′ x 11′; for Inland Waterways Corp., New Orleans, La.

JAKOBSON & PETERSON, INC.

Brooklyn, N.Y.

NEW CONSTRUCTION:

Hull No. 274, 84 foot all welded steel tug.

Hull No. 275, 70 foot auxiliary yawl.

Hull No. 276, 86 foot all welded steel tug.

LEVINGSTON SHIPBUILDING CO.

Orange, Texas

NEW CONSTRUCTION:

Two all welded petroleum barges 173′x39′x8′ 6″, for Pan American Refining Corp., Texas City, Texas. **Delivery date April, 1938.**

One all-welded petroleum barge 90′ x 30′ x 7′, for Standard Oil Company of Texas, Houston, Texas. **Delivered April, 1938.**

MANITOWOC SHIP BUILDING CO.,

Manitowoc, Wis.

NEW CONSTRUCTION: **One tanker** for Socony-Vacuum Oil Company, Inc., New York; 290′x49′ 6″x20′ 6″; 23,600 barrels capacity; 1500 H.P. twin screw diesel. Delivery date August, 1938.

THE MARYLAND DRYDOCK CO.

A Subsidiary of Koppers Company, Baltimore, Maryland

NEW CONSTRUCTION: **One double ended steel diesel ferry boat,** Gov. Harry W. Nice, 208′ x 62′ x 9′, for the Claiborne-Annapolis Ferry Company; keel laid September 15, 1937; launched December 11, 1937; **delivery date May, 1938.**

DRYDOCK AND ROUTINE REPAIRS: **City of Philadelphia, Sidney M. Hauptman, Charles R. McCormick.**

NEWPORT NEWS SHIPBUILDING & DRYDOCK CO.

90 Broad Street, New York

NEW CONSTRUCTION:

H360 aircraft carrier, CV6, Enterprise, for U.S. Navy.; keel laid July 16. 1934; launched October 3, 1936; **delivery date May, 1938.**

H361, light cruiser, CL47, Boise, keel laid April 1, 1935; launched, December 3, 1936; delivery date July, 1938.

H362, light cruiser CL49, St. Louis; keel laid December 10, 1936; **launching date April 15, 1938;** delivery date April, 1939.

Hulls Nos. 363-364, two destroyers, Nos. 413, Mustin, and 414 Russell; keels laid December, 1937; delivery dates June and August, 1939.

Hull No. 369, twin screw mail, passenger and cargo liner for United States Lines Co.; length 723′, beam 92′, depth 45′.

Hulls Nos. 370, 371 and 372, three oil tankers for Standard Oil Company of New Jersey; gross tonnage about 11,-500 tons; L.B.P. 525′; breadth molded 75′; depth molded 39′.

THE NEW YORK SHIPBUILDING CORPORATION

Camden, N. J.

NEW CONSTRUCTION:

Three light cruisers; Hull No. 412, Savannah (CL42), Hull No. 413, Nashville (CL43), and Hull No. 416 Phoenix (CL46) of 10,000 tons each for the U.S. Navy Department; keels laid, 1935. **No. 412,** launched May 8, 1937; **delivered March, 1938; No. 413** launched October 2, 1937; **No. 416** launched March 12, 1938.

One destroyer tender for U. S. Navy; order placed December 27, 1937.

One seaplane tender for U. S. Navy; order placed December 27, 1937.

PORTSMOUTH N. H., NAVY YARD

Portsmouth, N. H.

NEW CONSTRUCTION:

SS186 Stingray, submarine; keel laid October 1, 1936; L.B.P. 300′, beam 26′, loaded draft 15′7″; launched October 6, 1937; commissioned March 15, 1938; date of completion June 1, 1938.

Also building here, four more submarines, Sculpin, Squalus, Searaven and Seawolf.

THE PUSEY & JONES CORP.

Wilmington, Del.

NEW CONSTRUCTION:

Two single screw, steel freight steamers for the Philadelphia and Norfolk Steamship Co., Philadelphia, Pa. L. O. A. 292′, L.B.P. 280′, beam 48′6″, depth 32′ 3″, draft 18′; geared turbine drive 4000 S. H. P.; 2 water tube boilers. Keel laid for first ship May 20, 1937; launched February 15, 1938; **delivered April 15, 1938. Second ship launched April 14, 1938.**

Hull No. 1070, one steel hopper dredge, Chester Harding; 2,500 cubic yard capacity; length overall 308′2″, length B.P. 300′0″, breadth molded 56′ 0″, depth molded 29′0″. Contract date February 14, 1938; delivery in 12 months.

SUN SHIPBUILDING AND DRY DOCK COMPANY

Chester, Pa.

NEW CONSTRUCTION:

Hull No. 168, One diesel tanker for stock account, equipped with Sun-Doxford engine; 542′5″ x 70′ x 40′; 18,360 D.W.T. Keel laid August 19, 1937; **launched May 14, 1938;** delivery date June 1, 1938.

Hull No. 169, one oil tanker (steam), 520′ x 70′ x 40′; for Atlantic Refining Co.; 18,500 tons; keel laying date November 30, 1937; delivery date, August 1, 1938.

Hull No. 170, one single screw steam tanker for Bernuth, Lembcke Co., Inc., New York; length 462′4″; beam molded 65′ 0″; depth molded 35′ 0″, DWT approximately 12,900 tons. Keel laid September 15, 1937; **launching date April 30, 1938; delivery date May 7, 1938.**

Hull No. 171, one single screw steam tanker for Tide Water Associated Oil Co.; 462′ 4″ x 65′ x 35′; 12,900 dwt.; keel laid November 9, 1937; **launched May 28, 1938;** delivery date June 1, 1938.

Hulls Nos. 172, 173 and 174, three tankers for Standard Oil Co. of New Jersey; steam turbine; 525′ x 75′ x 39′; 16,300 dwt. Estimated keel laying date, No. 172, March 15, 1938; delivery dates April, 1939, November, 1939 and April, 1940, respectively.

UNITED SHIPYARDS, Inc.

Staten Island, N.Y.

NEW CONSTRUCTION:

Hull No. 856, fireboat for City of New York. Length O.A. 134′ 0″, breadth 32′ 0″, depth 13′ 3″. Keel laid April 2 1938; estimated launching date July 14, 1938; estimated delivery date August 25, 1938.

Pacific Paint & Varnish Co.

Synthex Red Lead Primer (Q. D.)
" Anti-Corrosive
" Anti-Fouling
" White Enamel-Non-Bilge (O.S. & I.S.)
" Cabin Enamels (Q. D.)
" Mast Colors, Hull Black
" Boottopping, etc.

Synthex Marine Spar Varnishes and Yacht White Enamel
Aluminum Enamel
Flat White (Inside & Outside)
A specialized finish for each paintable surface.

Pacific Marine Finishes have been used successfully for years by most of the important steamship companies. Each represents a specially developed product for a specific purpose. Quality—not price—is the objective of our Research Department.

L. M. DuCOMMUN, President — San Francisco and Berkeley — A. B. ROBERTSON, Vice President

SWAYNE & HOYT, Ltd.

SHIPOWNERS and AGENTS
215 Market Street - San Francisco, California, U.S.A.

GULF PACIFIC LINE
(Between Gulf Ports and Pacific Coast)

CALMAR LINE
(Between North Atlantic and Pacific Coast)

YAMASHITA LINE
(Far East—New York—South America)

OFFICES:
Seattle - Portland - San Francisco - Oakland - Los Angeles - Chicago - St. Louis - Cincinnati - New York
New Orleans - Mobile - Birmingham - Houston

SANDUSKY CENTRIFUGALLY CAST
BRONZE - BRASS - MONEL
TAIL SHAFT LINERS
PUMP LINERS - BUSHINGS
SANDUSKY FOUNDRY & MACHINE CO.
SANDUSKY, OHIO

TRADE LESLIE MARK
PRESSURE REDUCING VALVES
PUMP GOVERNORS
TEMPERATURE REGULATORS
SELF CLEANING STRAINERS

TRADE TYFON MARK
WHISTLES
SIGNALS

LESLIE CO., FOUNDERS AND MANUFACTURERS
LYNDHURST, N. J.
John H. Marvin, 1016 First Ave. So., Seattle

CORDES BROS, 200 DAVIS ST. SAN FRANCISCO

BABCOCK & WILCOX BOILERS

Extra Values to Ship Owners and Builders

In DESIGN
Marine Boilers for Marine Service

In TRIAL RUNS
Experience Frequently Saves Money

In CONTINUOUS SERVICE
Regular Visits of B & W Service Men

The BABCOCK & WILCOX COMPANY, New York

Pacific Coast Offices:
450 Mission Street - San Francisco
eattle — Portland — Los Angeles

Literature of the Industry

Marine Propulsion Units: 20 pages profusely illustrated and bound with art covers in two tones of blue. Published by Allis-Chalmers.

This booklet is a typographic gem. The lighter blue of the cover color scheme is carried through the book as a block tint background for illustrations and diagrams. It describes the Allis-Chalmers marine propulsion turbine as specially designed for marine propulsion application in connection with Falk reduction gears.

The design features of these turbines are the result of a continuous experience of 35 years in steam turbine manufacture. This experience includes some of the largest installations in this country with operating throttle pressures up to 1300 pounds and temperatures up to 925° F.

Details and assembly arrangements of the turbines are carefully explained in illustration, diagram and text.

Allis-Chalmers marine propulsion turbines are giving very reliable, satisfactory service with very low steam consumption rates aboard a number of modern American merchant vessels.

"When You Can Measure"; 32 pages profusely illustrated and bound in blue art covers; published by the General Electric Company.

William Thompson (Lord Kelvin), the great British scientist and in many respects the father of modern scientific measurement, is responsible for the title of this book, which is a quotation from an address made by him in 1883, beginning:

"I often say that **when you can measure** what you are speaking about and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meager and unsatisfactory kind; it may be the beginning of knowledge, but you have scarcely, in your thoughts, advanced to the stage of science, whatever the matter may be."

Doubtless there are millions who would heartily disagree with Lord Kelvin in this statement, but be that as it may, all must agree that accurate measurement, based on changeless standards, is a practically indispensable factor in the modern manufacturing and public utility industries.

This attractive, beautifully printed publication describes in pictures and in words the story of how instruments are designed, constructed and tested in the G-E "headquarters for electrical measurement."

Every development in electricity has grown out of experiments in which instruments played a major part. The incandescent lamp, the electric motor, electric household appliances, radio—none of these commonplaces of modern living would have been possible without the imposing array of ingenious, sensitive, accurate measuring devices engineers have perfected.

Since measurement, in its final form, depends upon comparison with some carefully chosen standard, a section of the booklet is given over to a description of the company's standards of voltage, resistance, time, and temperature.

● **Conical Self-Aligning Packing Glands**

A four-page colored and profusely illustrated brochure published by The Crane Packing Company, Chicago, Illinois. This booklet describes a new type conical, self-aligning packing gland adapted for ammonia, air and gas compressors, reciprocating pumps and engines. The record shows that on some jobs which formerly averaged a repack every thirty or forty days, this packing carried the same compressors twelve months or more.

The gland cup is made from nickel steel and fine bearing bronze, machine finished inside and out. When installed, it is packed with "John Crane" Super-Seal split packing inserts molded to fit the gland. The inner surface of the cup is tapered, the effect of which is to force the packing around the rod with each stroke of the piston, instead of merely compressing it in the gland and stuffing box.

Leakage and blowby are eliminated, even when machines are idle, and, using "John Crane" split packing inserts, a maintenance man can repack the gland in a few minutes. The ball and socket construction compensates for "float", present in varying degrees in pumps and compressors, and prevents wedging or distortion of the cup where it meets the cast steel follower, if the studs are drawn up unequally when the gland is being adjusted.

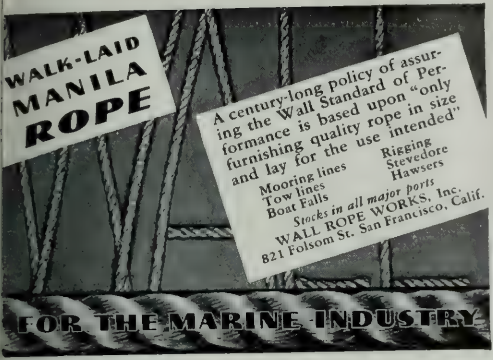
Each follower is stamped with a serial number, so that when packing inserts are needed reference to this number enables the manufacturer to ship inserts molded from master cups with the same number, carried in stock in Chicago. By this arrangement prompt delivery of glands and packing inserts, regardless of size, is assured. Any size or shape of follower may be obtained to fit existing dimensions or conditions, although the two stud type is most generally recommended.

This packing gland is adaptable for use on both the steam and liquid ends of pumps, and the power and compression ends of gas compressors where high pressures and temperatures create packing problems.

Foster Wheeler Corp. Opens San Francisco Office

The Foster Wheeler Corporation, one of the world's largest manufacturers of steam generating and heat exchange equipment for the industrial and transportation fields, announces the opening of an office in San Francisco which will be the headquarters for Robert D. Spear, who is in charge of Foster Wheeler activities on the Pacific Coast. Offices are also maintained in Los Angeles.

Mr. Spear returns to San Francisco after a period of four years in the New York offices of Foster-Wheeler. His many friends in the maritime fraternity around San Francisco Bay are glad to see "Bob" Spear back and wish him the best of success in landing contracts for his corporation.


WALK-LAID MANILA ROPE

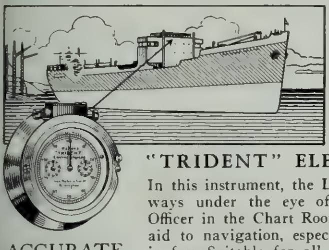
A century-long policy of assuring the Wall Standard of Performance is based upon "only furnishing quality rope in size and lay for the use intended"

Mooring lines
Tow lines
Boat Falls

Rigging
Stevedore
Hawsers

Stocks in all major ports
WALL ROPE WORKS, Inc.
821 Folsom St. San Francisco, Calif.

FOR THE MARINE INDUSTRY


New Building!

Specify WALKER'S "TRIDENT" ELECTRIC LOG

In this instrument, the Log reading is always under the eye of the Navigating Officer in the Chart Room. An invaluable aid to navigation, especially at night, or in fog. Suitable for all classes of vessels.

ACCURATE
RELIABLE

Of all Nautical Instrument Dealers

Thos. Walker & Son, Ltd.,
58, Oxford Street, Birmingham, Eng.

FRANCE

TRADE MARK

"Thirty-Nine Years Satisfactory Performance"

Manufactured exclusively by

FRANCE PACKING COMPANY

Main Office and Factory
TACONY, PHILADELPHIA

Represented by
SAN FRANCISCO—HERCULES EQUIPMENT & RUBBER CO.
550 - 3rd Street—EXbrook 2575
SEATTLE—GUY M. THOMPSON
1241 Railroad Ave., South—Phone MAin 1870
PORTLAND—E. B. HUSTON
127 S. W. First Ave.—Phone ATwater 6754

SPERRY

GYRO-COMPASSES
AUTOMATIC STEERING AND STEERING CONTROL EQUIPMENT
INCANDESCENT AND HIGH INTENSITY SEARCHLIGHTS . . . RUDDER INDICATORS . . . SALINITY INDICATORS

SPERRY GYROSCOPE CO, Inc.
BROOKLYN, NEW YORK

In tube cleaners as in everything else, nothing takes the place of experience.

ELLIOTT COMPANY
LAGONDA TUBE CLEANER DEPT.
LIBERTY TUBE CLEANER DEPT.

Factory Sales and Service Maintained
813 RIALTO BLDG., SAN FRANCISCO
Phone SUtter 5213
Los Angeles, 1732 E. 7th St. Seattle, Wn., 414 Vance Bldg.

-LUCKENBACH-

EASTBOUND SERVICE SAILINGS WEEKLY WESTBOUND SERVICE
MANHATTAN - - BROOKLYN - - PHILADELPHIA - - PROVIDENCE - - BOSTON

Sailings Every 14 Days to and from
NEW ORLEANS - MOBILE - HOUSTON

Coastwise Services Between
LOS ANGELES - SAN FRANCISCO - OAKLAND - STOCKTON
and PORTLAND - SEATTLE - TACOMA

TRAVEL BY FREIGHTER

LUCKENBACH LINES
100 Bush Street, San Francisco
Head Office: 120 Wall Street, New York

PASSENGERS . . . AND . . . FREIGHT

THE LARGEST AND FASTEST FREIGHTERS IN THE INTERCOASTAL TRADE

Covic Diesel Expansion

Important additions to the roster of Covic Diesel dealers in California, and several interesting installations of the recently introduced horizontal opposed engines, are announced by James Garvey, president of the Covic Diesel Pacific Company, Glendale, California.

Among the recently appointed Covic dealers are the Marine Supply & Engine Corp., San Diego; the Balboa Marine Hardware Co., Balboa; Fellows & Stewart, Inc., Wilmington; the Yacht Sales & Service Co., Oakland and Berkeley; and Cincotta Bros., San Francisco and Monterey, who will handle installations in the workboat field.

The first Covic installation among the company's West Coast dealer organization was made in the yacht Delphine by Fellows & Stewart. The Delphine, owned by Henry Hartman, is a 48 foot auxiliary sloop that was sailed from Sweden and was prepared by Fellows and Stewart for a South Seas cruise. It is powered by a single Covic Diesel equipped with a 3:1 reduction gear.

Fellows & Stewart have another boat on their ways that will utilize a Covic Diesel. The vessel is a new passenger boat to be used to transport hunting and fishing parties between Santa Barbara and Santa Cruz Island. Its main drive will be two 8-cylinder Superiors, with the Covic powering the electric generating plant and the fire and bilge pumps. The Covic will be hooked up to a 5 KW Westinghouse D.C. generator. Pumps and generator will be V-belt driven from an extension shaft.

903 FIFE BLDG.
1 DRUMM ST.

THOMAS A. SHORT

Successor to

C. V. LANE

Marine Representative:
Thos. A. Short,
1 Drumm Street, San Francisco

HYDE STEERING GEARS
HYDE WINCHES
HYDE WINDLASSES
HYDE CAPSTANS
HYDE MANGANESE BRONZE PROPELLERS & CASTINGS
A. B. SANDS & SON CO., PLUMBING FIXTURES
SMOLENSKY NOISELESS CHECK VALVES

BACHARACH INDUSTRIAL INSTRUMENT COMPANY
DIEHL MFG. CO. FANS, MOTORS, GENERATORS
SUBMARINE SIGNAL COMPANY FATHOMETER
COLORED CRAYONS
METAL WORKERS' CRAYONS
WELIN QUADRANT AND SHEATH SCREW DAVITS
MACLACHLAN GRAVITY DAVITS

LIFEBOAT WINCHES
METALLIC LIFEBOATS AND LIFERAFTS
SHORT OIL SEPARATOR
WILLIAM W. NUGENT & CO., OIL FILTERS
U. S. METALLIC PACKING
CONSOL RUST REMOVER
CONSOL RED and BLACK
HASKELITE—PHEMALOID
PLYMETL ORNAMENTAL PANELS

B. F. GOODRICH CUTLESS RUBBER BEARINGS

MEEHANITE CASTINGS—PISTON RING STOCK, BURNER CONES, ETC.   R. P. ADAMS POROUS FILTERS

SHORT OIL DETECTING SERVICE FOR PROTECTING BOILER FEED WATER AND FUEL OIL HEATERS

Hyde Windlass Company

Steering Gears, Windlasses, Capstans, Bronze Propellers —as installed on America's finest ships.

Bath, Maine

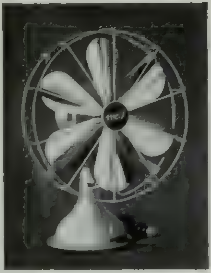
Pacific Coast Representative:
Thos. A. Short, 1 Drumm Street, San Francisco

Inter-Coastal Paint Corporation

SAN LEANDRO, CALIFORNIA

Originators and sole manufacturers of CONSOL both plain and in colors. A conditioning solution for metal surfaces that have become corroded. Not only a scale remover but a preservative as well. Gives excellent results when applied to boottop belt, hull, holds, bilges, tank tops, chain lockers, ventilator trunks, decks and so forth. Is non-inflammable and contains no acids or chemicals that are injurious to men or metal.

Marine Representative
Thos. A. Short, 1 Drumm Street, San Francisco



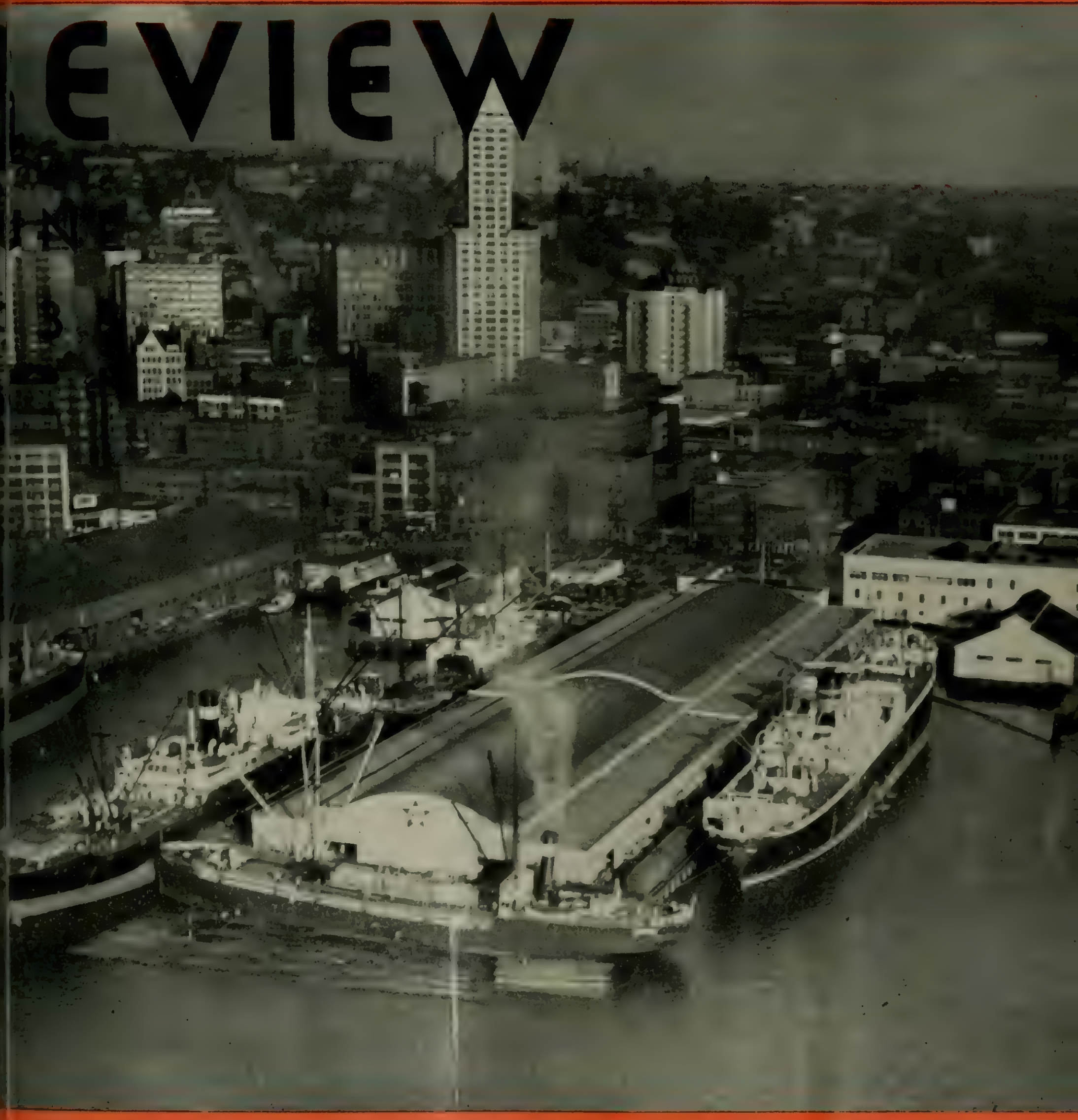
Marine Motors, Generators and Ventilating Equipment

DIEHL MANUFACTURING COMPANY

Electrical Division of
THE SINGER MANUFACTURING CO.
Elizabethport, New Jersey

San Francisco Representatives:
MARINE ELECTRIC CO. Desk and Wall Fans
THOMAS A. SHORT Motors, Generators, etc.

PACIFIC MARINE REVIEW



A Busy Day at the McCormick Terminal, Seattle

You'd know the QUALITY of a Vase like this

Only a casual examination of such a vase as this would be needed to tell its fine workmanship and quality. Just as, in the same way, you can quickly determine the quality of many products you use aboard ship.

But with a product such as rope, this kind of an examination means little. For far more important than its appearance is its proven ability to give dependable performance.

Brand name, then, and reputation and ability of the manufacturer are the basis upon which the experienced buyer of Marine rope must depend.

Behind Tubbs SUPERCORE and EXTRA SUPERIOR MANILA Marine Grade rope stands 82 years of proven leadership . . a leadership on which you can depend to give you the maximum in rope value and performance.

TUBBS ROPE

TUBBS *Cordage Company*
200 BUSH STREET, SAN FRANCISCO

PACIFIC MARINE REVIEW

UNE 1938
O. XXXV NO. 6

CONTENTS

Editorial Comment:

Mutual Responsibility of Employer and Labor 17
Appreciation 17

"Let's Start Rebuilding Our Merchant Marine in 1938" 18
Our Shipbuilding Program, with Particular Reference to the Pacific Coast.

The Status of American and World Shipbuilding 20
By H. Gerrish Smith.

Your Problems Answered 24
By "The Chief."

Steady As You Go 27
For the Deck Officers.

A Notable Tug Conversion 30

A New Pacific Coast Tanker 32

Port of Callao 34

A New Marine Diesel Engine 36

Testing Materials for High Temperature Turbines 40

Spunyarns and Catharpins 41

On the Ways:

Latest News from American Shipyards 42
Building in American Yards 54

Miscellaneous:

The Ship of the Year, 21; Literature of the Industry, 26; Engineers' Licenses, 26; Literature of the Industry, 31; A New Life Belt, 33; A Uniquely Complete Steam Trap, 38; Type MEH Exide-Ironclad Storage Battery, 38; Arc Welder Goes Deep Sea Fishing, 39; Two Interesting Diesel Electric Tugs, 39; Fireman's Fund Celebrates Birthday, 45; Explosion on the Motor Tank Vessel Gulflass, 46; Improved Foam Making Water Stream Nozzle, 52.

Our Frontispiece

Our frontispiece is reproduced m a photograph taken on the ast of Alaska in 1908. It shows fine old steel sailing ship Star Alaska under full sail beating ng the coast on a beautifully sun- sea and under magnificent cloud ects.

Star of Alaska was built in asgow, Scotland, in 1886 and ristened Balclutha. Operating first der British registry, she was purased by San Francisco-Hawaiian erests, put under Hawaiian regry, and came into American regy without change of name when waii became an American terory. In the early 1900's she was rchased by the Alaska Packers sociation and put on their anal run to the Alaska salmon heries.

All A. P. A. sailing ships have w been replaced by steamers. r of Alaska was sold some time ck and renamed Pacific Queen.

For the use of this photograph are indebted to the courtesy of ptain C. T. Surridge.

LISHED AT 500 SANSOME STREET . . . . SAN FRANCISCO

as second class matter June 20, 1913, at the post office, San Francisco, under the Act of March 3, 1879. Published on the 1st of each Advertising and editorial forms close on the 15th. Subscription price, one year: Domestic, $1.50; foreign, $2.50; two years: Domestic, foreign, $4.00; three years: Domestic, $3.00; foreign, $5.50; single copies, 25c. Chas. F. A. Mann, Northwest Representative, 1110 ound Bank Bldg., Tacoma, Washington. New York Office, Suite 404-405-406, Two Hundred Broadway, Telephone COrdlandt 7-3579.

York City copies of Pacific Marine Review can be purchased at the news stands of I. Goldberg, 42 Broadway; Jacob Fuchs, 17 Battery Philip Mandara, Greenwich Street and Battery Place. In Washington, D.C., at the news stand of the Carlton Hotel, 16th and K Streets.

S. Hines
t and Publisher

B. N. DeRochie
Assistant Publisher

Alexander J. Dickie
Editor

Paul Faulkner
Advertising Manager

F. Dryden Moore
Assistant Editor

PACIFIC MARINE REVIEW

OLUME XXXV JUNE 1938 NUMBER 6

Mutual Responsibility of Employer and Labor

By Roger D. Lapham

Labor's slogan "A UNITED FRONT" is more than a slogan. It has been a reality; although somewhat shaken during the past twelve months by the AFL/CIO jurisdictional fight. The labor leader is on the job twenty-four hours a day to get what he can for his men in the way of increased wages, shorter hours, and what have you. That's his job; and he is no amateur.

The employer, on the other hand, has not only got to produce his products or sell his services with an eye to the cash till, but he has got to do so in competition with other employers in the same line of trade. It is a much more difficult task for your competitive employers to sit around a table and bargain collectively with labor on wages, hours and other things, while your sales organizations are scrapping for a greater percentage of the total pot.

Yet experience has taught many of us and is still teaching us that, unless employers as a group in any industry, present a united front in dealing with the labor relations of that industry, the cash tills of all suffer immeasurably. It's the old story of "United we stand; divided, we fall," as witness the many instances where one employer has been played against another in collective bargaining negotiations.

Here in San Francisco, as elsewhere, we have a central labor council, made up of different locals, speaking for labor at least in the broader field of labor objectives. True, today this council does not speak for San Francisco labor as a whole. The AFL/CIO feud has temporarily halted the picture.

Here, also, we have the Industrial Association supported by over a thousand contributing members. It is doing what it can in these difficult days to compose differences arising between labor and individual employers and groups of employers. It might interest you to know that since January first, 1937, the Industrial Association took some part in 389 labor negotiations and adjustments. In many of these cases the Association directly represented

(Page 23, Please)

Appreciation

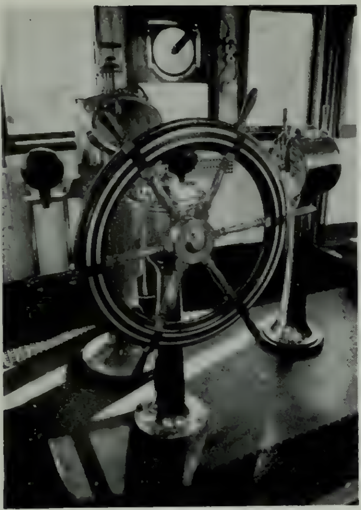
Pacific Marine Review is deeply grateful to "The Ships' Bulletin," published by the Marine Department of the Standard Oil Company of New Jersey, for the following "Editor's Note," which appeared in the current issue of that publication:

"For a year past The Bulletin has been publishing a series of articles entitled Your Problems Answered by 'The Chief', which are taken from The Pacific Marine Review. To augment the distribution, subscriptions to the latter publication were taken out by the Company for the Master, Chief Engineer and First Assistant Engineer of each of our vessels. Due to the favorable manner in which these articles have been received it has been decided to renew these subscriptions to include the Master, First Officer, Chief Engineer and First Assistant Engineer and the reproduction of the series will be continued in The Ships' Bulletin.

"It is the earnest hope of the publishers that the men in the fleet who have problems which come within the scope of the articles will not hesitate to communicate them to The Pacific Marine Review, 500 Sansome Street, San Francisco, California, where they will be given prompt attention."

"Let's Start

Our



Our Shipbuilding Program with Particular Reference to the Pacific Coast

A recent letter of Admiral Emory S. Land, chairman of the U. S. Maritime Commission, addressed to Senator McAdoo (Dem., California) and released to the press bears much promise for shipping and shipbuilding on the Pacific Coast.

This letter reads in part as follows:

"...the Commission is now approaching a solution of the shipping problems of the Pacific Coast area along the lines outlined herein.

"The Commission has determined that the Pacific Coast area requires the maintenance of American flag services over at least six essential trade routes, namely: Pacific Coast to Australia; Pacific Coast to South America; Pacific Coast to Europe; Southern Pacific Coast to the Orient; Northern Pacific Coast to the Orient; and Round-the-World service.

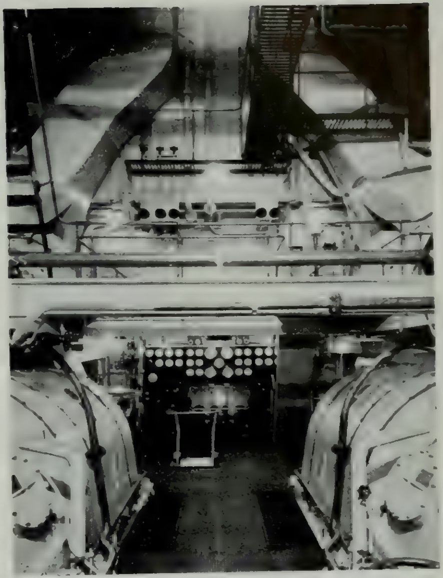
"The Commission also has determined that, in view of the approaching obsolescence of most of the vessels now covering these services there is an imperative need for the construction of a minimum of 24 new vessels, at an estimated cost of between $90,000,000 and $100,000,000 as follows:

"(1) The construction of 3 modern passenger vessels of the improved Coolidge design for operation in the transpacific service. The 3 new vessels, together with the Coolidge, will make it possible to maintain a fortnightly transpacific service.

"(2) The construction of 7 or 8 fast cargo vessels of a modified C-3 design, with a minimum 16½-knot speed, for operation in the Round-the-World service. These vessels will make it possible to maintain a fortnightly Round-the-World service. By combin

Three improved vessels of this type form the largest single item on the proposed program for Pacific Coast shipping replacements.

Rebuilding Merchant Marine in 1938”



ing the fortnightly sailings of these vessels with the transpacific vessels, the Pacific Coast will have a weekly sailing from the Pacific Coast to the Orient by fast American flag ships.

“(3) The construction of 5 or 6 vessels of a special design for operation between the Pacific Coast and the East Coast of South America.

“(4) The construction of 5 or more vessels of a modified C-3 design, with at least 16½-knot speed, for new fast service between the Pacific Coast and Europe, to operate on a fortnightly basis.

“(5) The construction of 4 or more fast cargo or combination vessels for fortnightly operation from the Pacific Northwest to the Orient, with a speed of at least 16½ knots. Whether such vessels should be cargo or combination type has not as yet been determined.

“Efforts are now being made to induce the investment of private capital in a sufficient amount to make possible the construction of these vessels for private account. However, the Commission will not allow the search for private capital to further retard the completion of the building program, which is so urgently required by the Pacific Coast. Accordingly, the Commission will proceed at once with the development of appropriate plans and specifications for the vessels above outlined. If reasonable bids for the construction of these vessels can be obtained, the Commission, with the approval of the President, will endeavor to carry through this construction program, notwithstanding the momentary inability of private capital to undertake the financial risks of this construction program.

“The Commission is also giving urgent consideration to the need for an intercoastal service for operation between the Atlantic and Pacific Coasts to replace the Grace and Panama Pacific vessels. After an exhaustive investigation, several alternative plans have been suggested. While we are not in a position to announce any definite proposal at this time, we are confident a reasonably satisfactory solution will soon be perfected.”

This is very encouraging news to the marine fraternity on the Pacific Coast.

A casual analysis of the five items involved in this minimum tentative construction program indicates that four of the items contemplate the building of vessels that are within the scope of the principal Pacific Coast shipyards. These four items total at least 21 vessels, with an aggregate cost of more than $50,000,000.

(Page 22, Please)

This fine Danish motorship is a typical example of the European competition in the Pacific Coast-European run.

The Status of American and World Shipbuildin

By H. Gerrish Smith

In his report to the members of the National Council of American Shipbuilders at its annual meeting at the Whitehall Club, 17 Battery Place, New York City, on April 21, 1938, Mr. H. Gerrish Smith, President of the National Council, stated that notwithstanding the fact that there is more tonnage of seagoing merchant vessels under construction at the end of 1937 than at any previous time since the completion of the building program fostered by the Merchant Marine Act of 1928 that there is only one vessel included in this tonnage that is being built for general passenger and cargo foreign trade.

● Merchant Ship Contracts

The total tonnage under construction at the end of the year was 243,000 gross tons and includes in addition to the one vessel for foreign trade, a number of oil tankers, three vessels for the Panama Railroad, four bulk cargo carriers for the Great Lakes and a large number of miscellaneous small craft, especially various types of barges.

Important amongst the contracts for oil tankers are 12 high speed vessels suitable for use as naval auxiliaries in which the government is contributing to the cost of increased speed and national defense features awarded early in January, 1938.

● Naval Vessel Contracts

There were 39 contracts for naval vessels on hand at the end of 1936 and 36 at the end of 1937, of which 8 were for contracts placed during 1937 consisting of

4 Destroyers	1 SeaplaneTender
2 Submarines	1 Destroyer Tender

● Working Conditions

All of the shipyards, with one exception, are now on a forty-hour week employment basis for new construction. The average weekly hours of employment for the shipbuilding and shiprepairing industries combined at the end of 1937 were 37.9 an increase of about 8 percent ove that at the end of 1936.

ADDENDA

This report reflects the condition of American and world shipbuilding as of January 1, 1938. Since it was written, considerable activity in orders for new ships has been apparent. The following new American shipyard contracts for vessels to engage in deep sea commerce should be added:

(1) Four Maritime Commission C-2 standard design cargo motorships to which the text refers as pending.

(2) Four Maritime Commission C-2 standard design cargo motorships and four Maritime Commission C-2 standard design cargo steamers.

(3) Four Maritime Commission C-2 standard design cargo steamers pending.

(4) One steam tanker for Union Oil Company of California.

(5) Four combination cargo and passenger steamers for Export Steamship Co. pending.

The total of these items is 21 vessels for the general cargo and passenger services overseas with an approximate total gross tonnage of 120,000.

Orders in foreign yards, particularly British, German and Japanese yards, have been even more active than in American yards, so that the relative position of America among the ten greatest shipbuilding nations is the same or slightly lower than was the case on January 1, 1938.

The average weekly earnings pe employee at the end of 1937 wer $32.69 as compared with $28.02 a the end of 1936, or an increase o about 16.5 percent. The averag hourly earnings in the industry a reported by the Department of Labo at the end of 1937 were 85 cents a hour as compared with 72.9 cents a hour for the durable goods industries as a whole.

● World Conditions

While world tonnage under construction at the end of 1937 was considerably in excess of that at th end of 1936 there was a falling of in orders for world constructio during the last quarter of 1937, du to the depression in business durin the latter part of the year.

Idle tonnage on July 1, 1937 wa the smallest in amount for severa years, but increased greatly durin the latter months of the year. Th 1,500,000 tons of idle shipping in th United States as of July 1, 1937 i cludes 113 laid up Maritime Co mission vessels which are being hel in reserve for a possible commerci or national emergency. During th year 75 laid up Maritime Commi sion vessels or a total of 613,00 gross tons were sold.

● Commission Handicapped

The future of seagoing mercha shipbuilding is dependent very larg ly upon the successful working o by the Maritime Commission appoin ed in 1937 of the provisions of t Merchant Marine Act of 1936. E forts have been made by the Co mission to provide for the constru tion of new tonnage in connecti with the long-range subsidy p grams with private operators, b th restrictive provisions contained in he Act of 1936 have been a severe hadicap to the furtherance of such a shipbuilding program. Amendmts to this Act, now pending befo both Houses of Congress, shld, when passed, be helpful to arliorating the above conditions.

s is well known to our members, th Maritime Commission is invokin the provisions of Title VII—Pvate Charter Operation—of the Mchant Marine Act of 1936 to st t a construction program of from 12 o 16 cargo vessels, contracts for 4 f which are now pending and bi for the other 12 of which are to be opened on May 3rd.

Future Orders

ther commercial work in sight cosists of 4 cargo vessels for the Eort Line, bids for which are to be opened on May 17th.

The regular naval program for 1938 consists of

2 Battleships	1 Minesweeper
2 Cruisers	1 Submarine Tender
8 Destroyers	1 Fleet Tug
6 Submarines	1 Oiler

a considerable part of which, it is expected, will be placed in private shipyards.

In the United States as elsewhere throughout the world the cost of ships, like all other durable goods commodities, has increased but the increase is due to reasons that are almost wholly beyond shipyard control, amongst the most important of which are the constantly increasing requirements in contracts and specifications, higher labor rates, higher material prices, increased inspection requirements and the effect of a number of legislative acts which have added to the cost of ship design and ship construction.

The Ship of the Year

ndoubtedly the Nieuw Amsterd, new flag ship of the Holl-America Line, is the ship of the yr. She left Rotterdam May 10 on h maiden voyage, arriving at New Yk May 17 and leaving on the retu trip May 21. In fact, all Holland clms that this vessel, by far the lagest ever built in the Netherlands, is ot only the ship of the year but tht she is "The Ship of Tomorrow," th most ahead of date liner afloat. Ts title is based on the following c ms:

1) She has the largest air condioning plant afloat;

2) She has the highest percentag of private baths and showers of a liner in transatlantic service;

3) She is more completely prote ed against fire than any vessel at;

4) She is the only liner fitted h a fully equipped air conditioned ter; and

5) In many ways the material workmanship used in her hull passenger accommodation set standards.

he principal characteristics of uw Amsterdam are:

gth overall	758 ft. 6⅜ ins.
gth waterline	725 ft. 11 ins.
gth B. P.	700 feet
Beam molded	88 feet
Depth molded main deck	55 feet
Keel to top funnels	147 feet
Keel to topmast	205 feet
Designed load draft	31 ft. 6¾ ins.
Gross register	36,287 tons
Displacement (load draft)	36,235 tons
Net register	21,496 tons
Shaft horsepower	34,000
Total cargo capacity	241,820 cu. ft.
Total deadweight	10,265 tons
Total passenger capacity	1,232
Total crew	650
Private baths	142
Private showers	232

Steam for propulsion is supplied by six Schelde-Yarrow oil burning water tube boilers with a working pressure of 550 lbs. and a total temperature of 743° F. Each of the twin propeller shafts is driven by a set of quadruple expansion Schelde-Parsons turbines. The super-high-pressure turbine takes steam at inlet pressure of 511 pounds and a temperature of 734° F.

Normal full load speeds and powers of the various stages of each set of turbines is:

Super-high-pressure—	3,600 r.p.m.	3,450 S.H.P.
High pressure—	1,600 r.p.m.	5,350 S.H.P.
Intermediate pressure—	1,600 r.p.m.	2,150 S.H.P.
Low pressure—	1,250 r.p.m.	6,050 S.H.P.
Total power on one propeller—		17,000 S.H.P.

The super-high-pressure turbine shaft carries a pinion meshing with a gear on the shaft of the intermediate pressure turbine. The pinions on the shafts of the high pressure, intermediate pressure and low pressure turbines mesh with a gear on the propeller shaft. Thus the super-high turbine drives through double reduction gearing and the rest of the turbines through single reduction.

This plant on trials at sea had no difficulty in driving the hull at better than 21½ knots.

There are three turbo generating sets which deliver 1000 K.W. each of direct current electrical energy at 220 volts. Two Werkspoor diesel generating sets of 425 K.W. each provide current for port use.

The electrical load comprises 15,000 lamps, and 375 motors with a combined output of 5,440 horsepower.

Nieuw Amsterdam is a very notable addition to the world's great liners, taking a proud place among the ten largest commercial vessels.

American ship operators on the Pacific are in competition with many fine modern European motorships like that shown here.

"Let's Start Rebuilding"

(Continued from Page 19)

The Pacific Coast business community should unite in a drive to bring about a speedy consummation of this program, and to bring the construction of these vessels to Pacific Coast shipyards. The building of these 21 ships would mean the distribution of a pay roll of at least $30,000,000 on the Pacific Coast. It would mean renewed activity not only to the shipyards but to many manufacturing firms, merchandising establishments, stores, restaurants, home builders, railroads, steamship lines, and street cars.

Of course, this initial program for the renewal of Pacific Coast shipping is just a preliminary step. Many more ships will be needed for replacement of our old and obsolete vessels in the various overseas shipping services and in the coastwise and intercoastal lines.

Admiral Land, in many speeches and papers, has outlined the complete 10-year program for the replacement of our overseas merchant marine.

At the Foreign Commerce Round Table Conference of the 26th annual meeting of the United States Chamber of Commerce, Washington, May 3, Admiral Land contributed to the discussion some very trenchant remarks about this replacement program from which we abstract the following:

Today the American merchant marine consists mainly of the remnants of 2,500 vessels built as The Bridge of Ships to France. Created practically as a unit, it is about to demise in the same way through our neglect to provide replacements.

While we have been drifting all our foreign competitors have been and are today diligently building modern, fast, economical ships with which our slow obsolete carriers cannot compete. Our only hope is to build new ships capable of coping with this competition.

Among the 8 principal maritime nations, on the basis of fleets engaged in international trade, the United States stands fourth in gross tonnage, sixth in speed, and seventh in age. This is pitiful for the richest nation on earth—a mercantile nation whose volume of foreign commerce is scarcely exceeded by that of any nation on earth.

Our replacement needs today are enormous. In vessels of 2,000 gross tons or over, the total American fleet in overseas trade today consists of 1,422 ships, aggregrating 8,470,000 tons. Of these ships 1,305, with a total gross tonnage of 7,402,000, will be obsolete by 1942. Replacement of this fleet would require the construction of 261 vessels (totaling 1,500,000 gross tons) per year for 5 years. At current costs this program would cost $2,500,000,000. We have neither funds nor facilities for such a titanic undertaking. The Maritime Commission has no thought of such a tremendous undertaking. We plan a more conservative approach.

The national defense is the Government's primary interest in creating a strong merchant marine. Our minimum needs on this basis, as reported by Navy experts, are 500 vessels of certain commercial types to be constructed within the next 10 years at an estimated cost of $1,250,000,000.

As a start in this program, all of the long-term operating subsidy contracts granted by the Commission stipulate the building of certain new ships. The contracts now in force call for a maximum of 59 such ships, 20 of which are to be on the ways in 1938. Contracts by the Commission to date include:

One transatlantic liner of improved Manhattan type; 12 high speed Naval auxiliary-Standard Oil tankers; and 12 standard C-2 design 15½ knot cargo carriers. Pending are four more of the 15½ knot cargo carriers, and four 16½ knot cargo carriers for the Export Steamship Company, bids on which were opened on May 17.

This program, as outlined by the chairman of the Maritime Commission is certainly comprehensive and far-reaching. But as he admits himself, the present commitments are only a poor start and fall far short the actual needs.

Of the 33 vessels involved in th above contracts and/or bids onl five are included in the 20 mentio ed above, which are to be laid dow this year under the operating su sidy agreements.

The first-mentioned program f Pacific Coast fleets is over an above these present shipbuildin contracts and is only the beginnin of a replacement program for th coastal region.

We cannot agree with Admir Land in the conclusion that a r placement program of 261 vesse per year for five years at a total co of $2,500,000,000 is out of the que tion—that "we have neither th funds nor the facilities for such a undertaking."

Great Britain, which had alread in 1936 the largest, fastest, an youngest merchant marine fleet, ha for the past two years been buildin new tonnage at the rate of 280 ve sels a year, with an aggregate to nage of 1,200,000 gross. Certainl we have greater resources tha Great Britain, and certainly also w have a larger volume of export to nage.

If we could agree among ourselve —the Maritime Commission—the S. Navy—and the American ship o erator—as to just the types, size and speeds of ships that would b best for American needs for the ne 20 years, we could not do a bett thing for employment of labor an cutting down of relief rolls than get busy on a program of 250 shi a year for the next 10 years.

Such a program would stimula activities in all lines of business a would in itself and in its ramific tions put millions of men at work. might conceivably reduce the reli rolls by an amount far more than th total cost of the replacement fle and its product would continue put men at work and to stimula trade for many years ahead.

Together with the proposed Nav program this undertaking would a long way toward solving our indu trial unemployment problems.

Let's make a real start on an ad quate merchant ship replaceme program to put new life into all d visions of our merchant marine.

Mutual Responsibilty of Employer and Labor

By Roger D. Lapham

(Continued from Page 17)

the employer, dealing with unions and negotiating agreements. In others the Association's representatives assisted in negotiations; while in still other matters, the Association made surveys, prepared reports, furnished statistical data, and acted generally in an advisory capacity.

he Industrial Association has encouraged and does encourage the development of such group organizations as the Associated Distributors, the San Francisco Retailers Council, the Hotel Employers Association, the Waterfront Employers Association, and other similar groups.

This is the trend of the times, and one which I believe will make for more stabilized labor relations in the long run. And incidentally, I am convinced that besides being a sounder and more effective way of dealing with common problems, it is the cheapest way expressed in dollars.

I would like to see the employers of San Francisco develop some kind of an employer federation where different groups of industry or business may be represented and have a voice in the determination of general labor policies affecting themselves as well as the community.

uch a federation might be a broader development of the Industrial Association, in that the directors of the federation could be appointed by their respective groups rather than, as is the case today, by the thousand-odd members of the Association.

I believe, if properly organized, such a federation would tend to weld and strengthen the employer group, and would promote the welfare of San Francisco.

do not mean this in the sense that employers should organize in any fashion to break any union. I believe that the principle of collective bargaining has come to stay and that employers must be far sighted enough, and flexible enough to adjust themselves to changed and changing conditions.

Roger D. Lapham.

Some labor leaders may look upon this idea with suspicion and distrust. Yet I think that a neutral observer will admit that where you have two strong parties, eventually you will have less trouble and more peace than if one party dominates.

In other words, there is less chance of bullying.

Let's liken the situation to two individuals sitting down to reach an agreement across the table — and where it isn't a question of brains alone. Two men of the same weight and strength are much less likely to clench their fists than where you have one man a foot taller and fifty pounds heavier than the man facing him.

It's human nature to respect your equal—as well as it's human nature to take advantage if you think you have the upper hand.

We in this country have a great flair for advocating legislation to cure all ills and usually that means special legislation to obtain a special advantage.

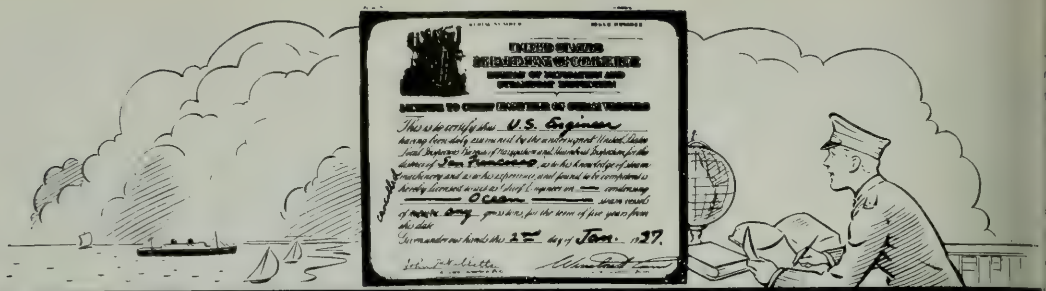
If the Wagner Act is with us to stay, it should be modified to make it more two-sided. But personally I believe labor and employer would fare better in the long run if they could do without government sitting at the head of the table.

So I emphasize this, and stress it strongly — that there is one thing that employer groups can do at once, if they have the will (and that means forgetting the past and sinking all the petty jealousies that exist among businessmen here and elsewhere)—and that is, to work together along the lines I have outlined.

And again I emphasize—NOT for the purpose of breaking any union; but with the idea of honestly trying to establish better relations between employer and employee; and with all the patience we possess and all the intelligent and logical thinking we can produce.

And remember—we all need policing; and it is the duty of employers to police their own ranks, as well as it is the duty of labor to police its own. Employer and labor have a mutual responsibility.

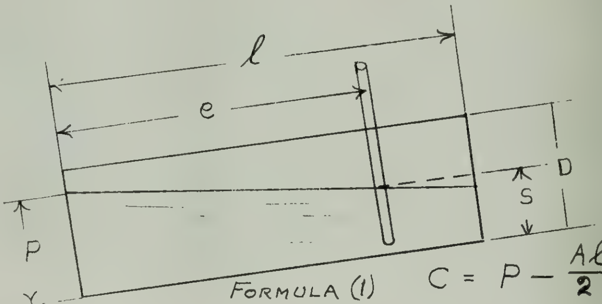
[Conclusion of an address of a meeting of San Francisco citizens in the San Francisco Commercial Club, May 20, 1938.]



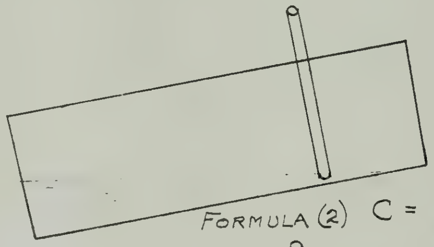
Your Problems Answered

by "The Chief"

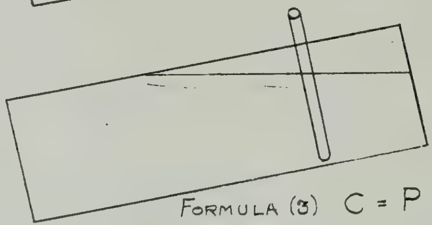
The word "Cancelled" was inscribed on face of the above license at the direction of the Bureau of Marine Inspection and Navigation. As used here it means "Specimen Copy."



FORMULA (1) $C = P - \frac{A\ell}{2}$



FORMULA (2) $C = \frac{P^2}{2A\ell}$



FORMULA (3) $C = P - \frac{A\ell}{2} - \frac{(P-D)^2}{2A\ell}$

Questions from the Field

QUESTION

Can you develop a formula which we can use to correct our double bottom soundings for the trim of the ship? For instance, suppose she is down by the bow three feet when we sound the double bottoms having fuel oil in them. Are our soundings now correct, and if not, how do we modify them?

ANSWER

This is a very difficult problem. Most engineers consider that the refinement in corrected results is not worth the labor of figuring the correction. There will be occasions where this correction may be very important to have. We give herewith a formula and procedure.

This procedure is based on a few assumptions, to wit, the tank has an approximately flat top and bottom which are parallel. The sides are approximately vertical and parallel.

No consideration is given to list of ship, as this complicates the problem beyond reason. The engineer is already in possession of a table or formula whereby he can sound depth in inches and translate the sounding into gallons or barrels of oil.

The problem divides into three possibilities, i.e. (1), the most common one, where top of tank is not wet or in contact with surface of oil, and bottom of tank is all covered with oil. This is solved by formula (1). (2). When the tank is nearly empty and the bottom is exposed at the high end. This uses formula (2). (3). When the tank is nearly full and surface of oil intersects top of tank. This uses formula (3).

Procedure

Let these letters represent the dimensions as indicated. (See figures.)

e = distance in inches between sounding well and that end of the tank having the deepest oil, i.e., that end of tank toward the end of sh which is trimmed down. This is fore and aft measurement.

D=depth of tank in inches.

l=length of tank, fore and aft i inches.

S=the sounding as taken in inche and is the depth of the oil in inch at he sounding well.

hen determine the angle ratio of th ship's trim. This is called A and

$$A\ \frac{\text{No. of feet off trim}}{\text{one half length of ship.}}$$

et P represent the depth of oil at th deep end of tank. Then P=S+Ae.

lso compute value of Al.

ext determine which of the fol-o ing formulas to use.

P is equal to or less than Al use fo nula (2).

P is equal to or more than D use fo nula (3).

therwise use formula (1).

sing the formula will determine th corrected sounding, i.e., the so nding which would have been obta ed had the ship been on an even tr with the same quantity of oil in th tank. From the corrected soundin the quantity of oil should then be obtained in the usual way, using th charts, prints or formulas which a on hand for that purpose.

here C is corrected sounding in in hes, we have:

ormula (1): $C=P-\frac{Al}{2}$

ormula (2): $C=\frac{P^2}{2Al}$

ormula (3): $C=P-\frac{Al}{2}-\frac{(P\text{-}D)^2}{2Al}$

xample Worked Out.

xample: Ship is down by the bow 3 eet. She is 300 feet long. Double b tom 4′ 6″ deep and 26′ long. Soundi taken is 24 inches. Sounding well i 20 feet from the low (forward) e of tank.

Agle ratio$=A=\frac{3}{\frac{1}{2}\times300}=\frac{3}{150}=.02$

S 24 inches.

e 20×12 = 240 inches.

P S + Ae.

P 24+.02×240.

P 24+4.8 = 28.8.

26×12 = 312 inches.

A .02×312 = 6.24 inches.

D 4′ 6″ = 54 inches.

is not less than Al and is not re than D; therefore use form (1).

rrected sounding is C.

$P-\frac{Al}{2}$

$C=28.8-\frac{6.24}{2}=28.8-3.12.$

C=25.68 inches. This is correct sounding from which to determine amount of oil in tank. It is 1.68″ more than measured sounding.

Suppose the same conditions, except the sounding, is 1¼ inches:

P=1.25+4.8=5.05 inches.

Al=6.24, as before.

P is less than Al; hence use formula (2).

$C-\frac{P^2}{2Al}$

$C\ \frac{5.05\times5.05}{2\times6.24}=\frac{25.25}{12.48}$

C=2.04 inches or .79 inches more than measured.

Suppose sounding is 52 inches, otherwise same conditions:

P=52+4.8.

P=56.8.

P is more than D; hence use formula (3).

$C=P-\frac{Al}{2}-\frac{(P-D)^2}{2Al}$

$C=56.8-\frac{6.24}{2}-\frac{(56.8-54)^2}{2\times6.24}$

$C=56.8-3.12-\frac{7.84}{12.48}=53.68-.63$

C=53.05, or 1.05 inches more than measured.

If this same ship were down by the stern instead of the bow, we would have a different e. The sounding well now is 6 feet, or 72 inches, from the low (after) end of tank. Otherwise we use formulas as above. The corrected values, C, would be less than the measured values, S, however, instead of more.

The ship's list has not been considered.

The development and proof of these formulas will be discussed on request.

QUESTION

I have been told that vertical, multi-cylinder engines of the Uniflow type have been built and used for marine application, each cylinder taking main line steam pressure and exhausting to condenser.

Why do they not compound this engine?

S. J. W.,
San Francisco.

ANSWER

The complete answer to this question involves a discussion on two related questions, namely: What is the advantage of compounding? And, What is the Uniflow engine?

Compounding reduces the difference in temperature between the inlet and exhaust ports, thus reducing the condensation losses.

The advantage of many cylinders does not belong alone to compounding, as we could have many small cylinders each taking H. P. steam and exhausting to condenser. We could adjust the cut off so that instead of taking full pressure steam for ½ to 2/3 of its stroke it would take steam for only 1/10 or even less of the stroke, the adjustment to be made so that in normal expansion the pressure in the cylinder would reach exhaust pressure just as the exhaust port opened. The higher the initial pressure or the lower the exhaust pressure, the shorter the point of cut off. But the trouble with this scheme is that the ports, cylinder walls, piston head and rod, which have just been subjected to the cooling action of exhaust pressure steam, are immediately thereafter subjected to high pressure steam. This results in a large condensation of steam on these surfaces, heating them up only to be cooled again when in the exhaust pressure area of the stroke. These surfaces take a mean temperature, and the result is a leakage of heat from high pressure to low pressure without doing useful work. This is called the condensation loss.

By compounding, the mean temperature of these surfaces is nearer to the exhaust and inlet temperature, as the pressure difference is less.

The Uniflow engine avoids using the same cylinder end for H.P. steam and exhaust alternatingly. The cylinder of a Uniflow engine takes high pressure steam at each end of the cylinder on each revolution; the steam at exhaust pressure is released to the condenser from the center of the cylinder. While the H.P. steam is entering at one end, the exhaust steam from the other end is leaving at the center.

Thus the Uniflow has a very short cut off, a long expansion. A multi-cylinder Uniflow would have cylinders all of the same size, hence always balanced at any load.

Literature of the Industry

Diesel Operation, Fuel, and Lubricants, an 80-page book bound in stiff paper, profusely illustrated, published by The Texas Company.

This book presents a thumb-nail sketch of the history and development of the diesel engine, and treats with great clarity the reasons for diesel fuel economy. The real theme is "The relation of fuel and lubricants to operating efficiency in the diesel engine."

Many pages are devoted to operating troubles and their elimination. The "Trouble Shooting Guide" is a valuable feature. Extensive tables give various data on: the physical properties and the performance of oils; the conversion of temperature scales; weights and measures; and viscosity determination methods.

Any diesel engineer will find in this volume valuable suggestions and data very conveniently and compactly arranged.

Nickel Cast Irons in West Coast Industries, a 40-page booklet profusely illustrated and containing numerous tabular statements of analyses and physical properties. Published by the International Nickel Company, Inc.

A very interesting and instructive brochure setting forth the uses and advantages of nickel alloy cast irons in many industries, with particular reference to Pacific Coast application. The recommendations for specialized uses of various alloys cover practically every application of cast iron in: power transmission; furnace parts; power generation; crushing and grinding; materials handling; heat transfer; and in all machinery details subject to wear, corrosion, scaling, warping, or growth.

The Gear with a Backbone, an 80-page loose-leaf, Roto bound, profusely illustrated catalog of the Farrel-Sykes gears, gear units, and gear generators. Published by Farrel-Birmingham Company, Inc.

This catalog is a very fine compilation for the designing engineer. It describes the gear units and gears very completely and gives dimensions of all the standard types of gear units over a wide range of capacities.

Since practically every new vessel built in America uses speed reducing gears, a catalog of this type becomes increasingly useful to naval architects, shipbuilders, and marine engineers.

Arc Welding Accessories, pamphlet GEA-2704, describes and illustrates the complete line of accessories for arc welding manufactured by General Electric.

Equipment for Traveling Electr Cranes, pamphlet GEA-2545, is a 1 page brochure setting forth the a vantages of General Electric equi ment for the operation of direct cu rent or alternating current power traveling cranes in industrial a manufacturing applications.

Pamphlet GEA-880A describes a gives dimensions of the Gener Electric protective panel for dire current electric cranes.

Engineers' Licenses

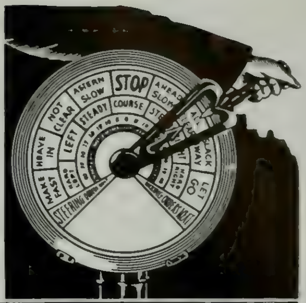
The following list shows the licenses granted during the month of April to engineer officers of the merchant marine at Pacific Coast offices of the Bureau of Marine Inspection and Navigation. For key to abbreviations see footnote.

Name and Grade	Class	Condition
SAN FRANCISCO		
Ole M. Johansen, Chief Eng.	OSS, any GT	RG
William O. Baxter, Chief Eng.	OSS, any GT	RG
Horatio J. Marsden, Chief Eng.	OSS, any GT	RG
Herbert Kampe, Chief Eng.	OSS, any GT	RG
Edward W. Sonderup, Chief Eng.	OSS, any GT	RG
Leo J. Lyskowski, 1st Asst. Eng.	OSS, any GT	RG
Charles A. Raiche, 1st Asst. Eng.	OSS, any GT	RG
Francis J. Petersen, 1st Asst. Eng.	OSS, any GT	RG
Richmond Barker, 1st Asst. Eng.	OSS, any GT	RG
Joe M. Gerlach, 1st Asst. Eng.	OSS, any GT	RG
James F. Murphy, 2nd Asst. Eng.	OSS, any GT	RG
Rex C. Winton, 2nd Asst. Eng.	OSS, any GT	O
David B. Walker, 2nd Asst. Eng.	OSS, any GT	O
Edward M. Downing, 2nd Asst. Eng.	OSS, any GT	O
Spencer E. Kemp, 3rd Asst. Eng.	OSS, any GT	O
Henry S. Williamson, 3rd Asst. Eng.	OSS, any GT	O
Frank J. Peterson, 3rd Asst. Eng.	OSS. any GT	O
Harold A. Scott, Chief Eng.	OMS, any GT	O
James B. Pringle, Chief Eng.	OMS, any GT	O
Kenneth P. Anderson, Chief Eng.	OMS, any GT	O
SEATTLE		
Robert T. McRae, Chief Eng.	OMS, any GT	O
Theodore Christensen, 1st Asst. Eng.	OSS, any GT	RG
Oskar Johansen, 1st Asst. Eng.	OSS, any GT	RG
Arnold E. Zachow, 2nd Asst. Eng.	OSS, any GT	RG
Maurice R. Hinckley, 2nd Asst. Eng.	OSS, any GT	RG
Merle W. Barker, 3rd Asst. Eng.	OSS, any GT	O
Joseph J. Fritz, 3rd Asst. Eng.	OSS, any GT	O
JUNEAU		
Robert E. McMahon, Chief Eng.	OSS, any GT	RG
SAN PEDRO		
George Lindsay, 2nd Asst. Eng.	OSS, any GT	RG
Edwin F. Langshaw, 2nd Asst. Eng.	OMS, any GT	O
PORTLAND		
Peter Muntz, Chief Eng.	OMS, any GT	O
Leo C. Martin, 1st Asst. Eng.	OSS, any GT	RG
Ronald S. Duffie, 3rd Asst. Eng.	OSS, any GT	O

Abbreviations: GT is gross tonnage; RG is raised grade; O is original license; OSS is ocean steamer; OMS is ocean motorship.

Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A DEPARTMENT FOR DECK OFFICERS

Tropical Cyclonic Storms

n alluding to a cyclone we are referring to a characteristic circulati of air round a central area of l atmospheric pressure without rard to the force of the wind assocted with it. The term "cyclone" trefore includes not only the revving storms of the tropics in wich the wind blows with great violce, but also all wind systems, of h h and low latitudes, in which the a circulation is cyclonic. In these srms the same air particles do not kp with the whirl throughout its cer, as there is a continual degdation and re-formation as it mves along the earth's surface. For t purposes of the practical naviga, however, it may be assumed that t tropical revolving storm is invarile in its composition over small dtances of the track followed.

he cyclone of tropical origin, or tpical revolving storm, with which have now to deal, is known in dferent localities by distinctive nmes. In the West Indies and in the ands of the South Pacific these srms are called Hurricanes, in the rth-West Pacific and China Sea ty are known as Typhoons, and in Indian Seas simply as Cyclones. all the atmospheric disturbances approach of which the barometer icates, and consequently enables seaman to avoid, these storms are the most serious. They are seldom experienced within 5 degrees or 6 degrees of the equator; but their track occasionally extends from the tropics to high latitudes.

The geographical conditions which are most favorable to their formation and development are found where the coastlines of large continents, in which are many bays and indentations, run north and south, and face to the eastward a wide expanse of sea, in which are many islands. Such conditions are more or less fulfilled in the regions to which reference has been made.

Revolving storms have a progressive movement. The wind blows in a more or less spiral direction towards the centre, and at the same time the storm field advances on a straight or curved track. Cases exist in which the velocity of advance of the system has amounted to as much as 45 miles an hour, and in others the translation was not more than two miles an hour.

The track which the centre of the storm follows is known as the path of the storm, and that part of the storm on the right of the path, as it advances, is named the right-hand semi-circle, and on the left, the left-hand semi-circle.

● Extent of Area

The area over which these storms have been known to extend themselves varies from 20 to 30 miles to some hundreds of miles in diameter, the wind blowing with varying force, sometimes lulling into little more than a strong breeze, and as the centre is approached often rising into a blast of almost irresistible fury.

One semi-circle of a storm is known as the dangerous semi-circle because a vessel might be driven when in it across the path of the storm, and would certainly cross the path if she ran before the wind. The right hand is the dangerous semi-circle in the Northern Hemisphere, and the left-hand semi-circle in the Southern Hemisphere. The other semi-circle, in each case, is termed navigable.

● Zones, Tracks and Seasons.

In the Atlantic and South Indian Oceans these storms commence to the Eastward and travel along a path not exactly West, but inclining a point or two towards the pole of the hemisphere in which they have been generated; as they advance, they curve away still more towards the pole, and finally move to the N.E. in the Northern hemisphere and to the S.E. in the Southern Hemisphere. They move, in fact, round the sub-tropical high-pressure areas. The Atlantic storms almost always wheel round to the Northward in the vicinity of the Bahamas, and follow the sea-board of North America; but some recurve in the Gulf of Mexico, and a few appear to pass on to Mexico without recurvation.

The cyclone season of the South Indian Ocean may be considered to commence in November and end in May; but cyclones occasionally occur in June, July and October. In August and September, however, it would appear that they are altogether absent from the South Indian Ocean, as there are no records of their occurrence in those months. The maximum frequency is found between January and March, and the minimum from May to October. The probability of encountering a South Indian Ocean cyclone is therefore greatest when the sun's declination is south, and least when it is north. These cyclones frequently originate on the tenth parallel of south latitude, travel south-west along a parabolic track to a vertex in about 21° S. then recurve, and eventually move to the south-eastward. At rare intervals, however, the point of curvature is as far north as 8° S., or as far south as 32° S. As regards the longitude of the vertex, it may be on any meridian between Keeling Island and the Mozambique Channel. South Indian Ocean cyclones travel but slowly, the average rate being about six miles an hour.

In the South Pacific, the season for tropical revolving storms commences with December and ends with March, although an occasional hurricane may be experienced in April. They generally originate to the north-east of the Fiji Islands, and the rate of travel is said to vary from about two miles an hour in the lower latitudes to 20 miles an hour in 30° S. While passing over the island groups these storms appear to be almost stationary for a time.

Typhoons of the China Sea originate to the eastward of the Philippines, Carolines, and Ladrones. In the lower latitudes the centres travel westward. Some pass over the mainland, some recurve to the eastward, and eventually reach the west coast of North America by way of Japan. Tracks of tropical storms of the North Pacific are very similar to those of the North Atlantic. These tracks may be divided into two broad classes—those of the Pacific, which do not cross the meridian of 124° E., and those of the China Sea, which either cross that meridian or are formed in the China Sea.

Between December and March, the centres of the former class of cyclones travel N.N.W., the latitude of the vertex lies between 15° N. and 19° N., and they travel thence to the N.N.E. In April and May, as also in October and November, the corresponding movement of the centres is N.W. to about 16° N. to 21° N., thence N.E. Between June and September the tracks are N.W. by N. to about 21° N. to 25° N., thence N.E. by N.

### ● Rate of Travel.

A typhoon is considered to travel rapidly, in the vicinity of the Philippines, if its velocity of translation exceeds 12 miles an hour; and slowly if it moves at a rate of less than 12 miles an hour. The same storm may be rapid, moderate, or slow, during varying phases of its existence; it may be moderate in the lower latitudes, almost stationary at point of recurvature, and rapid in the higher latitudes. Of typhoons that crossed the Archipelago, or the adjacent regions of the ocean, which have been traced, 40 travelled rapidly, 180 with moderate speed, 30 moved slowly, and a few remained stationary for several days.

The rate of movement of thes storms, though variable, may be a eraged at 300 miles a day in the Wes Indies; in the Arabian Sea, in th Bay of Bengal, and in the China Se 200 miles a day; while in the Sout ern Indian Ocean their rates var from 50 to 200 miles a day. Record seem to show that at the beginnin or end of the hurricane season a co siderable proportion of the storm in the Indian Ocean are either st tionary or slow in movement.

● Indications.

The indications of the approach a revolving storm are (a) an u steady barometer; (b) the usual ugl and threatening appearance of th weather which forbodes most storm and the increasing number and seve ity of the gusts with the rising of th wind; (c) a long heavy swell whic generally comes from the directio in which the storm is approaching, o a confused sea.

In every case there is great bar metrical disturbance, the baromete at the centres of some of these storm standing fully two inches lower tha outside the storm-field.

British Appreciation for an American Shipmaster

It is just over 100 years since Captain Thomas H. Sumner, an American master mariner thirty years of age, approached St. George's Channel in a heavy southeast gale with thick weather. The southeast coast of Ireland was a lee shore, the dead reckoning position was open to doubt, and a time sight for longitude was imperative. At 10 a.m. on December 17, 1837, an altitude of the sun was taken, and the deduced position indicated that the ship was in a safe but none too enviable a position.

The dead reckoning latitude was open to question, and Sumner assumed two other latitudes and plotted the appropriate positions on the chart. The three positions made a straight line, and one of the positions was that of the Smalls lighthouse. His quick brain realized that all these three positions must have had the same altitude at the same moment, and that the line of th three positions must be the line bearing of the Smalls L.H. The shi was headed along the "position line, and the Smalls was raised exactly a expected. So was born the Sumne method.

Not once or twice in the histor of mankind have new discoverie been made independently by diffe ent men at different places, but the same time. It appears to hav occurred again in this case. Co mander Sullivan, R.N., in the sam year but at the entrance to the Rive Plate, used exactly the same metho but in conjunction with a soundin to fix his ship's position.

But we neither propose nor wish t question the justice and propriet of calling this method after that n vigator whose name is firmly an irrevocably associated with it. Other may have used it on occasion, but h alone saw the wider scope of its a plication; he alone realized its great importance and the effects of its impact upon navigational practice. He alone published a volume to make the method known and understood.

In 1843 his book, "A New and Accurate Method of Finding a Ship's Position at Sea," was issued. It met with the usual apathy from the majority.

In 1850 he became mentally afflicted, was confined in a lunatic asylum, and his works and his history ceased. As a result of his wife's appeal to Congress, the copyright of his book was bought by the Government of the United States. Many years passed before the method became popular, but when it did become popular it swept all before it. St. Hilaire and De Aquino and others have extended its application and simplified its working, but we pay homage to that lone figure who, one hundred years ago, discovered "a new and accurate method" and saw that it was good.

BIDS CALLED ON SEVEN COAST GUARD CUTTERS

The Coast Guard has invited bids for building seven 110-ft. Coast Guard Harbor Cutters Nos. 74 to 80, inclusive. The bids will be received until 2:00 p.m., June 15, 1938, and then publicly opened.

Two cutters shall be completed and delivered within three hundred sixty (360) calendar days; three or four cutters within three hundred ninety (390) calendar days; and five, six or seven cutters within four hundred twenty (420) calendar days after date of receipt of notice to proceed. Delivery and acceptance will be made, at the option of the contractor, at any United States port on the Atlantic, Pacific or Gulf Coasts or on the Great Lakes.

Specifications and drawings for the cutters may be obtained by shipbuilding companies from the Commandant, U. S. Coast Guard.

No deposit for plans.

Bid bond, 25 per cent of the bid.

Performance bond, 50 per cent of contract.

Payment bond, 50 per cent of the contract.

Liquidated damages $100.00 per day.

Partial payments will be made.

Deck Officers' Licenses

The following list shows the licenses granted during the month of April to deck officers of the merchant marine at Pacific Coast offices of the Bureau of Marine Inspection and Navigation.

Name and Grade	Class	Condition
SAN FRANCISCO		
Walter A. Shea, Master	OSS, any GT	RG
Robert W. Lindgren, Master	OSS, any GT	RG
Richard Moczkowski, Chief Mate	OSS, any GT	RG
John Janus, 2nd Mate	OSS, any GT	RG
Vernon Lams, 2nd Mate	OSS, any GT	O
Adolf H. G. Raediker, 2nd Mate	OSS, any GT	O
Glenwood H. Hines, 2nd Mate	OSS, any GT	O
Hartley M. Stajohann, 2nd Mate	OSS, any GT	RG
Geoffrey H. Blackett, 2nd Mate	OSS, any GT	RG
Alexis O. Kustel, Jr., 3rd Mate	OSS, any GT	O
Arnold C. Erickson, 3rd Mate	OSS, any GT	O
Stanley Janislawski, 3rd Mate	OSS, any GT	O
Edward E. McDermott, 3rd Mate	OSS, any GT	O
Sidney C. Rogers, 3rd Mate	OSS, any GT	O
Thomas E. Bryant, 3rd Mate	OSS, any GT	O
Henry W. Simonsen, 3rd Mate	OSS, any GT	RG
HONOLULU		
Bruce Pfeiffer, Chief Mate	OSS, any GT	RG
John J. Harris, 2nd Mate	OSS, any GT	O
John Ingram White, 3rd Mate	OSS, any GT	O
SEATTLE		
Otto A. Ford, Master	OSS, any GT	RG
Kenneth M. Dodson, Master	OSS, any GT	RG
Reuben Jacobsen, Chief Mate	OSS, any GT	RG
Peter F. Butler, Chief Mate	OSS, any GT	RG
Sverre E. Vikane, Chief Mate	OSS, any GT	RG
Clare W. Barnhart, Chief Mate	OSS, any GT	RG
Amigo Soriano, 3rd Mate	OSS, any GT	O
Jack M. Radford, 3rd Mate	OSS, any GT	O
Elmore F. Maxwell, 3rd Mate	OSS, any GT	O
Ernest J. Klein, 3rd Mate	OSS, any GT	O
SAN PEDRO		
Horace D. Byington, 2nd Mate	OSS, any GT	O
Clarence M. Boyd, Chief Mate & Pilot	CW. SS, any GT	RG
Harold F. Foster, Chief Mate	OSS, any GT	RG
George S. Schmitt, 3rd Mate	OSS, any GT	O
PORTLAND		
Clifton V. Parker, Master	OSS & OMS, any GT	RG

Abbreviations: GT is gross tonnage; RG is raised grade; O is original license; OSS is ocean steamer; OMS is ocean motorship.

Change of Masters

Steamer El Segundo: G. A. Johnson; vice, A. H. Markley.
Steamer Manini: Stephen King; vice, W. J. Norberg.
Steamer Constance Chandler: L. G. Vick; vice, W. H. Turnquist.
Steamer Texan: W. C. Brown; vice, T. J. Butler.
M/S Hawaiian Standard: J. Orlando; vice, C. Baker.
Steamer Mauna Loa: F. M. Graham; vice, F. N. Troupe.
Steamer Celilo: Alfred Waagen; vice, A. F. M. Abbors.
Steamer W. S. Miller: John Engs; vice, H. O. Bleumchem.
Steamer El Segundo: A. H. Markley; vice, G. A. Johnson.
Steamer D. G. Scofield: H. O. Bleumchem; vice, A. H. Koskin.
Steamer H. M. Storey: G. A. Johnson; vice, Joseph Fox.
Steamer Noyo: John Bostrom; vice, C. P. Nielsen.
Steamer Point Chico: C. Hunter; vice, Joel Tobiassen.
Steamer Kansan: K. Hansen; vice, L. C. Hansen.
Steamer H. M. Storey: Joseph Fox; vice, G. A. Johnson.
Steamer F. H. Hillman: A. H. Koskin; vice, J. A. Christenson.

A Notable Tug Conversion

Todd Dry Docks, Seattle, Change Big Steam Tug R. M. Woodward into a Modern Fairbanks-Morse Diesel Driven Tow Boat

One of the most important additions to the large fleet of Pacific Coast tugboats is the big all-steel diesel tug Neptune, just completed in Seattle for account of the Puget Sound Tug and Barge Company, one of the largest operators in the Northwest.

This vessel, formerly the husky steel steam Government tug R. M. Woodward, was purchased by the Seattle interests last fall in San Francisco and brought up to Puget Sound for a complete rebuild job. H. C. Hanson, Seattle naval architect, was assigned the task of working up details, and the actual rebuilding was done by the Seattle plant of Todd Dry Dock & Shipbuilding Corp.

What was originally a 500 horsepower steam tug with somewhat limited cruising range has appeared as a 1050 horsepower diesel tug with bunkering capacity for 40 days at sea at full power! Her power plant is built around a completely self-contained Fairbanks-Morse two cycle full diesel, having six cylinders 16 x 20 in size and operating at a top speed of 300 r.p.m.

Neptune has a length between perpendiculars of 109 feet, a beam molded of 23 feet, a depth molded of 11 feet 2 inches, and a draft of 11 feet. Her gross tonnage is registered at 188. In the rebuilding process, heavy steel engine foundations were laid down and three very large welded steel fuel tanks fitted—one forward, one ahead of the engine room, and one aft, with a total bunker capacity of 40,000 gallons of fuel.

A 3,000 gallon fresh water tank is provided forward. Of particular interest is the ingenious use of space in the engine room and area above. The top of the cylinders clear the grating and catwalk overhead by a fraction of an inch and a hinged catwalk has been built atop the cylinder bank so that it may be thrown back and permit hoisting pistons, etc., by means of the monorail hoist that traverses the upper part of the engine room and engine trunk.

Below, forward, and located directly over the water tank, is a roomy forecastle with bunks for eight and ample locker space. Immediately aft of this compartment is a large oil tank formed by two steel transverse bulkheads extending from keel to main deck level. The engine and all auxiliaries, including two large heat exchangers, are installed in a neat adaptation of the space formerly occupied by the steam boiler and engine. This Fairbanks Morse power plant has a capacity almost exactly double that of the steam engine.

Her main engine has lubricating oil, fuel transfer, bilge and fresh water circulating pumps and a single stage compressor, all driven by a walking beam off the scavenging air pump connecting rod. Belt-driven off the main engine flywheel is a 25 KW. General Electric auxiliary generator. When at sea the entire power plant operates off the main engine, except the salt-water circulating pump for cooling the heat exchangers.

The engine cooling system is a closed circuit fresh water system, operated either by the main engine plunger pump or by either of two motor driven rotary pumps. This fresh water circuit is cooled by salt water through a Shutte & Koerting Heat Exchanger and is thermostatically controlled to maintain constant engine temperature.

The lubricating oil system require a 200 gallon day tank storage to a sure full operation, as the lubrica ing oil is used both for lubricatio and piston cooling. A salt water coo ed Shutte & Koerting heat exchang er, thermostatically controlled, mai tains constant temperature in th cooling oil. Lubricating oil supply carried in an 800 gallon tank in th engine room. Two Nugent oil filte are fitted on the operating side o the main engine and a Gould Hydro Purifier set is installed for cleanin the lubricating oil in circuit. Th has an electric heater and is bot thermostatically and pressure - co trolled to operate off the battery ci cuit without attention.

A Kingsbury Thrust Bearing mounted almost directly on the e gine base and is continuously lubr cated. The propeller is a 3-blade bronze wheel of the Tru Pitch d sign, with 86 inch diameter and 6 inch pitch, designed by the Fairbank Morse Company and built by th Coolidge Propeller Co. of Seattle.

A combination of bilge, fire an scow pumps is laid out with inte connecting supply and discharg lines to handle a variety of requir ments in this type of service. Th auxiliary pumps include: a Rex bilg pump; a Gardner-Denver salt wate circulating pump, driven by a 7 h.p. G.E. motor; a De Laval 4 g.p.m. fresh water engine circulatin pump driven by a 20 h.p. G.E. moto a Blackmer Rotary Lubricating O pump, operating at 40 lbs. pressu and 200 g.p.m. discharge rate; small Gardner-Denver two cylind air compressor; and a Fairban Morse fresh water system. A larg Crane heating boiler, fired with De Luxe motor driven burner, su pl heating steam and hot water wh n needed, and steam to operate a sm ll scow pump with high suction.

he steering gear is a converted st m rig, operated by compressed ai Air is stored in two large tanks fit d in the engine room, the larg- est being 6 x 10 feet in size. A large RI auxiliary air compressor of 80 CF capacity is installed for emer- ge y charging of the air bottles.

he towing winch is a converted A rican Ship Windlass Company's he y duty model, with worm geared 50 orsepower G.E. motor drive on on end and compressed air drive on the other. The electric drive oper- ate through a 9.7 to 1 reduction ge the motor being mounted inside the upper part of the engine room, wit drive shaft extended through the rear bulkhead. The towing wi h is fully housed as a protection ag st weather. On the forward de a Markey Anchor windlass is fit , with 15 H.P. General Electric dri .

ong other electrical items of in- er t is the Alnor engine pyrometer, he arge Square D electrical control swi hboard, and the powerful 2-way No hern Electric Co. radio set. This et as a range of 5,000 miles.

e Neptune ran her trials off the me ured mile on Vashon Island on Ap 9, with a party of distinguished Sea le waterfront people. On four rip over the course the average of- ici speed was 13.84 knots with the ng e turning up around 293 r.p.m. or he four runs.

T Puget Sound Tug & Barge Co., d-established Puget Sound tow- oa firm, now includes the former ar Davis organization and the en- re arge fleet of the former Drum- Lighterage Co. George John- eads the big combine as presi- with George Cary as vice-presi- Harrison Hart, secretary; A. Nealy, treasurer; Capt. Lindley , general manager; and Otto er, port engineer. It was Otto er who supervised the job on eptune.

The diesel tug Neptune running 13.84 knots.

w's quarters are spacious, and e equipped comfortably with ng water and steam heat. In on to the space for eight in the forecastle, there are three staterooms on the main deck. A large wardroom and mess hall is located forward, with passageway between the deck toilets and lockers, leading back to the galley. A Frigidaire set and an oil burning galley range is fitted here. Aft is what is popularly known as the "poker room," where the crew can gather when off duty. The rest of the main deckhouse is taken up with the upper engine room and towing winch space.

The pilot house and chartroom have not been altered greatly, except for installation of the radio set. The captain's room is located here.

A feature of this diesel installation is quiet operation. The single-acting scavenging pump receives air from a space under the main deck, which has been equipped with baffles and two welded steel ducts leading to ventilators on the upper deck. This minimizes intake noise. The entire exhaust line after it leaves the manifold of the main engine is uninsulated welded steel piping. In spite of the fact that no muffler is used, the engine is very quiet when under way.

Not only is the Neptune the largest diesel tug on Puget Sound, but she rates as the biggest steel tug job for H. C. Hanson, the busy Seattle naval architect. Mr. Hanson has a dozen jobs under way at the present time.

Literature of the Industry

Leaflet GEA-672 illustrates and describes General Electric float operated switches to central automatic pumping equipment for water level control.

Leaflet GEA-1423A sets forth the advantages of using General Electric solenoid operated valves for controlling the movement of fluids in pipes.

Brochure GEA-1587C tells all about the General Electric combination magnetic switch for full voltage starting of induction motors.

Booklet GEA-2473, in 12 illustrated pages, develops the range of forms and types of General Electric push button stations for use with magnetic controllers.

Leaflet GEA-1884A. Four pages of text and illustration covering General Electric multi-speed induction motors of the squirrel cage and of the wound rotor types.

Broadside GEA-2635 records the possibilities in savings through the use of General Electric recording watt-volt-and ampere meters.

Publication GEA-2011A introduces its readers to Inspector AP-9, who typifies a line of General Electric medium sized indicating instruments, the use of which will enable any manager to discover power leaks or inefficient power applications.

A New *Pacific Coast Tanker*

Union Oil Company of California Orders 13,000 Ton Bethlehem-Frear Type Oil Carrier from Bethlehem Shipbuilding Corp., Ltd.

On March 15, 1938, the Union Oil Company of California contracted for the construction of a new marine transportation unit embodying all the latest improvements for vessels of this type.

On the facing insert we reproduce the inboard profile and general arrangement deck plans of this vessel, which show clearly the arrangement of hull cargo spaces, machinery spaces, crew and officer accommodations, and deck machinery. The following is a general description:

The vessel with its equipment and propelling machinery will be built under special survey and classification of the American Bureau of Shipping for carrying petroleum products in bulk with flash point below 150° F. and all requirements of the General Rules and Regulations and the Load Line Regulations prescribed by the Bureau of Marine Inspection and Navigation at the time of signing of contract.

She will be in strict conformity with and to meet and pass all the current regulations of the Panama Canal and Suez Canal authorities for bulk petroleum products carrying vessels and for transport and handling of all categories and grades of special hazardous and dangerous petroleum products, especially Grade "A" Panama Canal Classification of products.

This vessel will have a single screw and will be of the American three island tanker profile, with straight raked stem and cruiser stern. The hull will be constructed on the Bethlehem Frear system of fluted bulkheads and connected longitudinals.

Her general characteristics are:

Length overall	463′ 0″
Length between perpendiculars	442′ 0″
Breadth molded	64′ 0″
Depth molded to upper deck at sides	34′ 10″
Sheer forward (at F.P.)	10′ 0"
Sheer aft (at A.P.)	5′ 0″
Camber, upper deck	0′ 16″
Designed loaded draft molded	28′ 4″
Displacement, molded, at designed loaded draft	16,968 tons
Deadweight, at designed loaded draft	13,000 tons
Shaft horsepower, normal	3,500
Speed, loaded, on trial	13 knots
Cargo capacity, at 98% (Gasoline)	101,400 bbls.
Forward deep tank (3950 barrels)	633 tons S.W.
After bunker, fuel oil	5,700 bbls.
Fresh water capacity, double bottom aft	119 tons
Drinking water aft	80 tons
Steaming distance	20,000 miles

As in all modern American vessels, special attention is being given to the problem of providing comfortable accommodations for officers and crew. Living quarters both for the officers and unlicensed personnel are to be constructed of fire-resisting material and the furnishings are of the latest type in art metal. Officers' quarters are arranged for single occupancy, are of ample proportion, well lighted and well ventilated. Deck officers' quarters amidship are so arranged as to provide full access to the navigating bridge without the necessity of going on deck in bad weather.

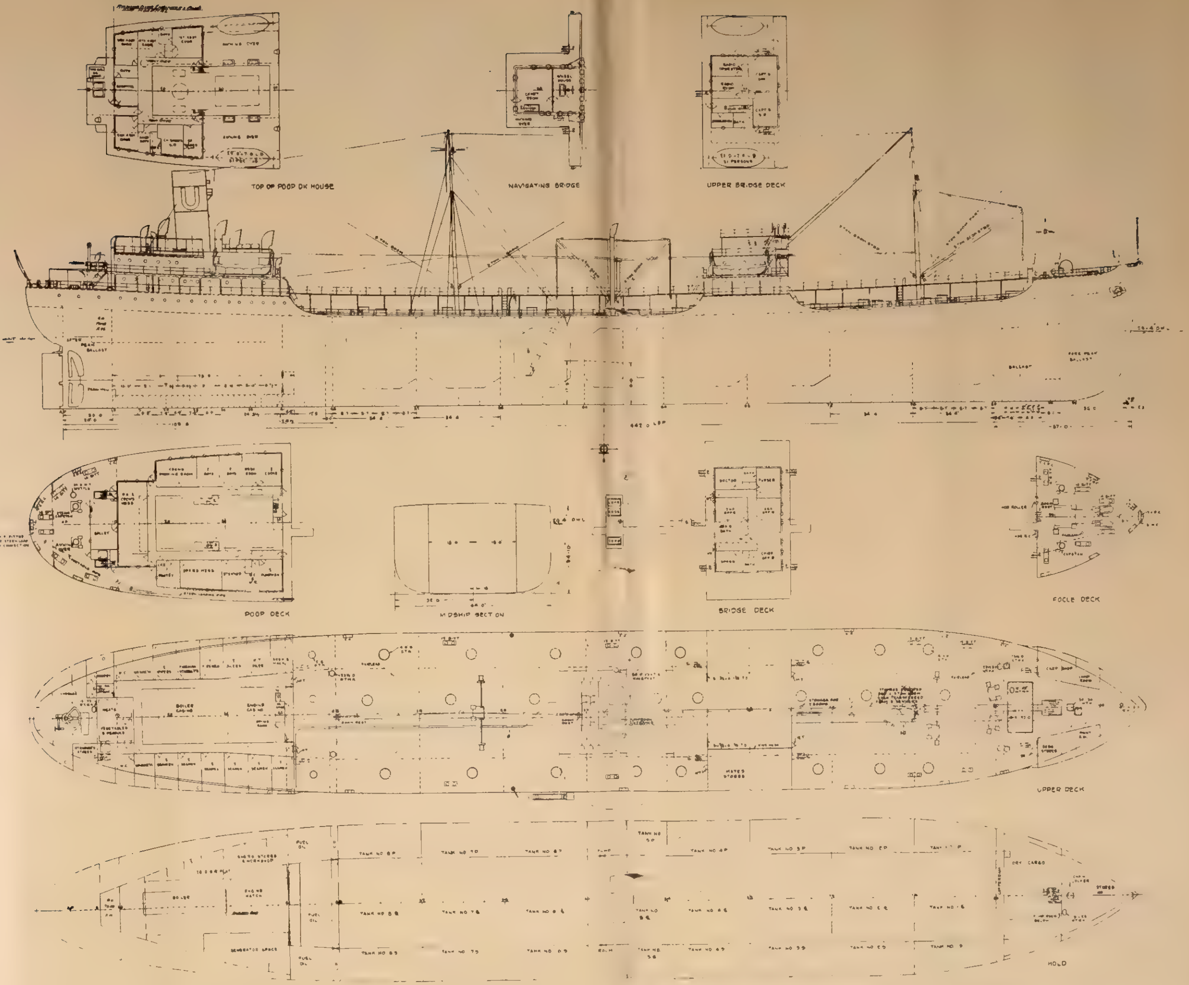
Engineer officers' quarters, located on the poop deck well above the weather deck, are of ample size, well lighted and well ventilated, and are provided with passageways for entering engine room without exposure to inclement weather.

Quarters for unlicensed personne are all located aft on the main deck and arranged for double occupancy only. The furnishings are of the latest art metal with lockers of ample size for a complete seaman's wardrobe; the berths are of ample size and of the improved metal type.

The living quarters, lavatories messrooms, and pantries, in the poop deck house and on the main deck under the poop, are all mechanicall ventilated to provide fifteen changes of air per hour for each room and space. As a further effort to provid more comfortable temperature conditions in way of the living quarters in poop deck houses, the usual heat radiation from the boiler uptakes and breechings will be eliminated by th use of sprayed asbestos and plasti covering on all uptakes and bulkheads in the upper fire room area.

All living quarters are provide with running hot and cold water, an cool drinking water is provided from a drinking fountain connected to scuttle butt located in the refrigerator chambers. All quarters an spaces are heated in cold weather b use of the latest type of steam radiator with air circulation.

Two dining rooms, one for the of



Inboard Profile, Midship Section and general arrangement deck and hold plans of tanker now building by the Bethlehem Shipbuilding Corporation Ltd. for the Union Oil Co. of California.

fers and one for the unlicensed personnel, are located on the upper poop deck aft; both rooms are large and well provided with air ports in addition to mechanical ventilation; the furnishings of both dining rooms are in keeping with those used in the living quarters.

A lounging room has been provided on the upper poop deck for use of the crew. It is well furnished with suitable settees, chairs and tables, and will accommodate one-third of the crew, thus providing ample space for recreation during inclement weather.

In the painting of the interior of the living quarters a departure from the usual practice will be made. In lieu of a gloss white finish all over, the ceiling only will be painted white, with the side paneling an olive green of light shade and the trim of a slightly darker shade. In this manner a very pleasing effect will be accomplished and the usual glare will be reduced without sacrificing illumination.

The galley is of large proportions and located on the upper poop deck aft. An oil burning range will be provided and in addition an ample supply of the latest type aluminum cooking utensils. The ventilation of the galley will be well provided for by the installation of two large ventilators, a large overhead skylight, port holes and doors.

The pilot house and bridge are of modern design and will provide for the accommodation of all the latest aids to navigation, such as automatic depth sounding, gyro compass, automatic steering device, radio compass, and the latest type radio communication apparatus. A helm angle indicator which closely follows the position of the rudder will be fitted.

Steering will be accomplished by a spring quadrant type gear, driven through spur and worm gearing by a double cylinder piston type reverse valve vertical steam engine. A contraguide rudder of latest design will be installed.

Anchor chains are of cast steel construction, and the maximum strength is provided with the minimum weight.

Mooring equipment consists of two steam capstans on the forecastle deck and two on the poop deck aft. In addition two large steam warping winches are provided, one on the well deck forward and one on the well deck aft; both winches have extended shafts with large gypsies fitted. A complete set of mooring bitts, chocks and fair leaders has been fitted to provide efficient and prompt handling of all mooring lines.

Handling of dry cargo which is carried in the forward hold is provided for in the form of two high speed steam driven cargo winches fitted aft of the hatch.

A very flexible pumping arrangement of the Union Oil Company design has been installed. The system provides for handling three commodities at one time and the combined pumping rate will be approximately 9000 barrels per hour. It is also arranged for separate loading of each cargo tank without flooding back through bottom suction lines.

The vessel will be fitted with the Union Oil Company's own design of an inert gas system for protection of the main cargo tanks from fire and explosion. This system also provides the inert vapor pressure for handling casing head gasolines. The engine and fire rooms are fitted with a fixed fire protection system of the CO_2 gas type installed to meet the Bureau of Marine Inspection and Navigation requirements.

The propelling machinery will consist of a high pressure ahead turbine cross compounded with a low pressure ahead turbine and driving the propeller through double reduction gears. An astern turbine will be incorporated in the low pressure turbine casing. These turbines will be of the impulse reaction type, designed for high economy with a sufficient number of stages for the complete expansion of the steam.

Steam will be supplied by two "D" type water tube boilers, burning oil under forced draft and located on a flat aft of the main turbines; the boilers will be equipped with economizers, superheaters, desuperheaters, and soot blowers. A complete system of automatic combustion control will be fitted for each boiler together with full control of boiler water treatment. The steam pressure at throttle will be 375 lbs. gage and about 725° F. temperature. The main condenser will be of the two pass underslung, reheating type capable of providing a vacuum of 28¼" Hg.

The auxiliary machinery will be apportioned to steam and electric drive in order to provide an efficient heat balance.

There will be two 125 K.W. 240 volt turbine driven geared generator sets to provide the necessary electric power. These units may be run separately or in parallel.

Power circuits will be 240 volts while the lighting circuits will be 115 volts fed by two motor generator sets, each of which has 20 K.W. capacity.

An interesting departure from the standard practice of fire pump installation has been made, and a diesel engine driven centrifugal pump with a capacity of 450 gallons per minute at 125 lbs. pressure has been provided; the fire protection salt water system is self-contained and does not depend upon either of the two boilers being in operation.

A modern system of tank cleaning and washing has been provided.

A New Life Belt

Out of Detroit comes a very clever little device for keeping persons afloat in water. It bears the interesting name of Lyf-Boy, and consists of a rubber tube 10 inches long and about two inches wide with a small container in one end filled with chemicals.

On slight positive pressure these chemicals unite to form a gas which inflates the rubber tube into a ball some nine or ten inches in diameter and keeps the ball inflated for some 16 hours.

This tube is attached to a strong web belt fitted with an adjustable quick fastening buckle. With the belt in place, the rubber tube is on the front of the body between the waist line and the chest. In this position it will float the heaviest person face up.

Recent tests by Red Cross, Boy Scout, and Life Guard units, and by Recreation Departments have demonstrated Lyf-Boy to be a very handy and useful life saving equipment.

Modernizing the Old Ports of Peru

Photo by W. Chas. Swett
Courtesy of Capt. G. Allan Hancock

The 3-masted bark Tellus rides high at anchor in Callao's modern harbor.

Important improvements to the harbor at Callao, Peru, which serves all of the central portion of the South American republic, were observed by members of the Allan Hancock Expeditions on the recent cruise of the Velero III, floating scientific laboratory built by Capt. G. Allan Hancock.

Peruvians are proud of many improvements completed and under way under a $16,000,000 program designed to facilitate handling of 1,000,000 tons of cargo annually. The ancient harbor at Callao bears approximately the same relation to Lima, the nation's capital, as Los Angeles Harbor bears to the metropolitan area of Los Angeles and the southwestern United States of America.

The port of Callao is one of the oldest on the Pacific Coast. The early Spanish explorers found refuge behind San Lorenzo and Fronton Islands and the projecting peninsula La Punta. New and old equipment and methods are seen side by side. Old square-riggers and schooners ply Peruvian waters alongside large modern bottoms of the Grace Line and numerous round-the-world vessels.

The old Spanish city and much of the old port works were completely destroyed by an earthquake in 1746. First modern port works at this site were completed in 1875 and comprised berthing space for 30 seagoing steamers or sailing vessels, served by 18 steam cranes and a triple line of railway along the dock wall. These docks were piped for gas illumination and for an ample supply of fresh water. This construction was largely due to the influen the Pacific Steam Navigation pany, who had made Callao thei cific headquarters and maint there a great ship repair and c tioning establishment. As far as 1863 they had built in Gla and towed out to Callao a flo dry dock 300 feet long and ca of lifting vessels of 21 feet draft weighing 5,000 tons.

In the 1870s Callao average trances of 2,000 seagoing shi year. Pacific Steam Navigation pany alone averaged a steam week from Liverpool, via Valpa Straights of Magellan and Rio, in addition weekly steamers Panama, and bi-weekly from Va aiso.

Those were the glorious s guano, and precious metal e days, somewhat based on the r inglorious trade in contract Ch coolie labor.

In the old days this port was pled by all seafaring men with expression "Callao painter," w referred to the sulphuretted h gen gas that bubbled up fro strongly impregnated subm spring and "did things" to s paint.

Much of this work of 1875 through neglect become unu and the present undertaking is claim and renew the former wor

Breakwaters at Callao, which a commodious pear-shaped ha

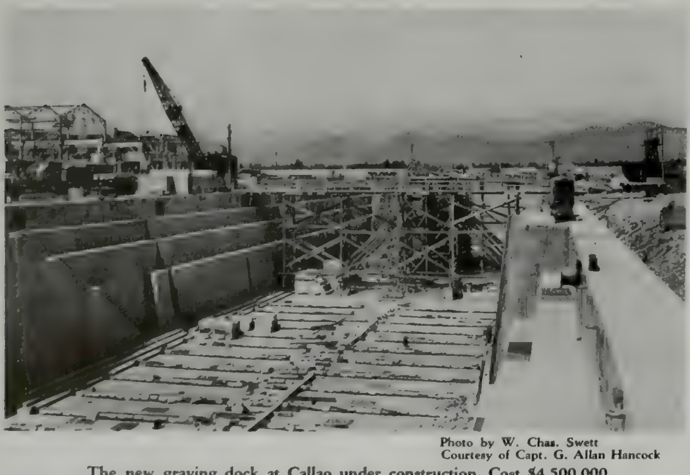


Photo by W. Chas. Swett
Courtesy of Capt. G. Allan Hancock

The new graving dock at Callao under construction. Cost $4,500,000.

ar being strengthened and improved The breakwaters are 3,575 and 7,17 feet long and encompass an ar equivalent to 655 acres. The sea ga is 590 feet wide and channels ar 35 to 37 feet in depth. Buoys and a fog siren increase the safety of the harbor, the entrance to which is guarded by two lighthouses.

harfage for eight large vessels at time is now provided at Callao Harbor, and facilities for two more large vessels are included in the program now under way. Plans call for a large new fill to expand the waterfront area by the equivalent of 17 city blocks. This will provide space for additional wharfage and new buildings, which will completely change the face of the old waterfront.

Special provision has been made within the protected harbor for large fishing fleets which supply the markets of central Peru. Small sailing vessels comprise the great majority of the fishing fleet, but many new and modern motorized fishing boats are entering the trade.

Further extension of the port works at Callao include a new graving dock costing $4,500,000, which is nearing completion, and a new $1,000,000 Naval arsenal. In addition to the arsenal there will be seventeen separate units in the Naval shipyard including machine shops, a boiler factory and foundry.

In addition to improvements of the Callao port works, the Peruvian Government early this year authorized construction of a new port at Matarani, north of Mollendo, as a principal port of entry for southern Peru. Contracts calling for expenditure of approximately $5,000,000 toward construction of this new port were signed early this year.

Matarani Bay is located on the coast northwest of Mollendo and will replace the latter port as the Pacific terminal of the Southern Railways of Peru, owned by the Peruvian Corporation. These railways serve Arequipa, Cuzco and the Lake Titicaca region, and connect with La Paz, Bolivia, on the through rail route to Buenos Aires. Projected breakwaters and wharf at Matarani Bay will provide exceptional shelter to ship-

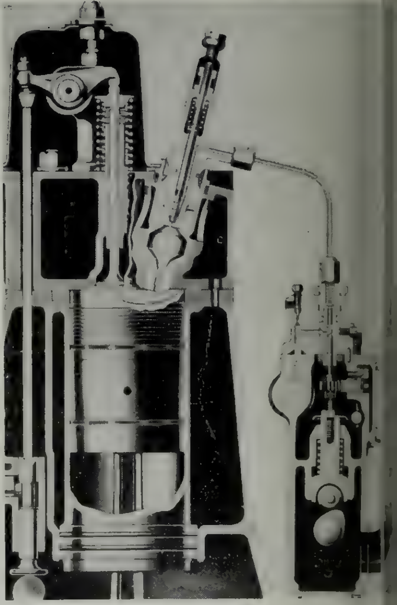
Photo by W. Chas. Swett
Courtesy of Capt. G. Allan Hancock

Steamers, motorships and sailing vessels from all over the world discharge and load at Callao. Present total import and export trade stands at $150,000,000 a year.

A NEW

Marine Diesel Engine

Two sizes of a six-cylinder workboat propulsion unit developed by the Caterpillar Tractor Company



Sectional view of cylinder of Caterpillar D-13000 diesel engine, showing pre-combustion chamber and fuel injection system.

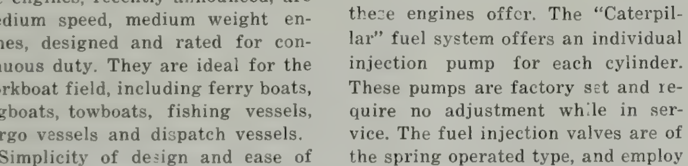
The two "Caterpillar" diesel marine engines, recently announced, are medium speed, medium weight engines, designed and rated for continuous duty. They are ideal for the workboat field, including ferry boats, tugboats, towboats, fishing vessels, cargo vessels and dispatch vessels.

Simplicity of design and ease of maintenance are two advantages that these engines offer. The "Caterpillar" fuel system offers an individual injection pump for each cylinder. These pumps are factory set and require no adjustment while in service. The fuel injection valves are of the spring operated type, and employ no mechanical means of opening.

When the pressure of the fue
built up by the pump overcomes
tension of the valve spring, the
head lifts and sprays fuel into
pre-combustion chamber throug
single orifice 3/16′ in diam
which size practically precludes
having a clogged spray valve. Va
like the pumps, are set at the fa
and require no attention on the
Both pumps and valves are of '
erpillar" design and manufactur

The pre-combustion chambe
these engines is set into the cyli
head, and is confined within
movable alloy steel piece, and
the atomized fuel is injected into
chamber, it is ignited and part
burns. This creates a high pre
in the chamber, and ejects the
ture of burning fuel and gas
the main combustion space,
burning is completed. The fuel
gases passing out through the o
hole from the pre-combustion c
ber have a high velocity. Conseq
ly, there is an excellent mixing
the air in the main chamber, r
ing in practically complete com
tion at varying loads and speed

A spring loaded, flyball type
ernor is mounted on the cam



The Caterpillar D-13000 marine type six-cylinder, four cycle diesel engine. A dependable continuous 100 H.P. at 900 r.p.m.

el. The engine is always under the ontrol of the governor, so that the hrottle lever is really the governor ping control. The lever setting determines the approximate speed of he engine, and the governor controls the fuel injection pumps, to upply the quantity of fuel necesary to balance the load.

he pressure lubricating system akes care of all the bearings and ther parts that need lubricating. here is an oil sump in the crank- as pan near one end of the engine. h sump is designed so that the il will drain to it even though the ngine be tilted at a considerable ngle.

Clutch oil, as well as engine crank- ase lubricating oil, is cooled by eans of an oil cooler located in the uction side of the cooling water ump.

he cylinder block is in one piece, hich also forms the upper part of he crankcase and carries the main earings for the crankshaft. These earings are bored after assembly in he cylinder block and are doweled o locate them in place. Removable wet type cylinder liners are used, held in place by the cylinder head. The inlet and exhaust valves seat directly in the head and have separate bronze stem guides. Valves are operated by push rods and rockers from the cams on the camshaft in the crankcase. These push rods are enclosed in tubes, plainly visible on the cut ide of the engines.

"Caterpillar" Engines are ruggedly constructed and designed to handle varying or continuous heavy loads. Because of their inherent simplicity, they can be easily operated by unskilled personnel. However, the efficient organization of "Caterpillar" distributors and dealers can supply 24-hour service to almost every part of the United States, and when replacement parts are needed, can supply them quickly throughout the world, avoiding prolonged and expensive shutdowns.

Both of the regular marine engines available are six-cylinder, 900 r.p.m. models. The D13000 model has a bore and stroke of 5¾" x 8" and develops 100 horsepower. The D11-000 model, with a bore of 5¼" and a stroke of 8", develops 80 horsepower. These ratings are for continuous, sustained operation, by which is meant 24 hours a day, 365 days a year, if desired.

A number of Caterpillar D-13000 and D-11000 models have been for several months in the hard service of driving harbor tugs with very economical and satisfactory results. All of the kinks have been ironed out and the engines are in commercial production. They are obtainable through any Caterpillar agency in the United States and throughout the world.

Into these engines there has been built the engineering knowledge, the metallurgical research and the manufacturing skill which have given to industry and to agriculture that dependable and husky tool known as the Caterpillar tractor. After considerable study, research, and experiment the Caterpillar Tractor Company developed a satisfactory diesel to use as a prime mover on their tractors. Possibly no industrial application of an engine is more analagous to the power plant on a workboat than is that of a tractor. The tractor engine must work with its crank shaft and its cylinders at many angles and must be sturdy enough to take many severe shocks and smilingly ask for more. Just so with the workboat engine.

It was therefore a natural step for Caterpillar diesel engineers, having perfected the diesel for tractor purposes, to adapt that same diesel for the marine workboat field.

This sturdy harbor tug of Houston, Texas, is powered with a Caterpillar D-13000 diesel engine.

A Uniquely Complete Steam Trap

The Super-Silvertop Steam Trap as manufactured by the V. D. Anderson Company has many unique advantages. These include:

Simplified installation.
High capacity.
Good accessibility.
Large area passages.
Free travel of bucket.
Long life.

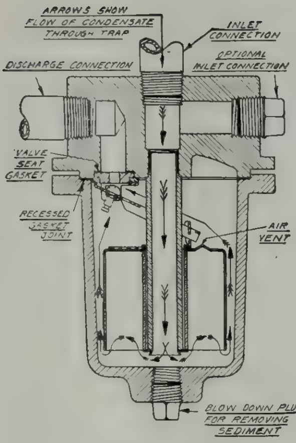
These traps are installed either straight in line or as an elbow without the necessity of any extra pipe fittings.

The design gives a very high comparative capacity rating.

It is not necessary to disturb the pipe connections when inspecting or dismantling the mechanism of this trap. Remove the head bolts and the body of the trap and the entire mechanism is open to inspection.

The large area passages in this trap and the fact that there are no cored passages to collect scale eliminate the necessity of installing strainers.

The Super-Silvertop steam trap is a simple, compact unit easily installed in line or as an elbow.


ARROWS SHOW FLOW OF CONDENSATE THROUGH TRAP
INLET CONNECTION
DISCHARGE CONNECTION
OPTIONAL INLET CONNECTION
VALVE SEAT GASKET
RECESSED GASKET JOINT
AIR VENT
BLOW DOWN PLUG FOR REMOVING SEDIMENT

Section through Super-Silvertop trap, showing mechanism.

In the V. D. Anderson trap, the bucket is guided on a hexagonal center tube by knife edge friction free contacts. This design feature eliminates side wall dragging, jambing or other interference with bucket movement or trap operation.

Super-Silvertop traps are built for long years of service. All working parts are made of heat treated stainless steel, except the valve and valve seat, which are of Anderloy, a chrome alloy of great hardness and toughness developed by the V. D. Anderson Company especially to resist erosion and wire drawing as met in steam trap service.

Special traps in the Super-Silvertop line are designed to eliminate entrained air.

A more recent addition to this line are the forged steel heads and bodies to adapt the Super-Silvertop traps to the higher ranges of steam pressures.

Anderson Super-Silvertop steam traps are distributed in the San Francisco Bay area by the Frank Groves Company of San Francisco and Oakland.

Type M.E.H. Exide-Ironclad Storage Batte

Another super-type of electric
dustrial truck battery is announ
by The Electric Storage Battery Co
pany, the second within the past
months. This newest battery is
Greater Exide - Ironclad Ty
"MEH," the first shipment of wh
left the Exide plant in Philadelp
recently.

This battery has capacity enou
to provide power and speed to op
ate trucks of 30,000 pounds or m
capacity for 12 or more hours on
charge. It has more cells and a lar
number of plates per cell, and con
quently more power, than the Ty
FLM, which was announced seve
months ago as "the world's larg
battery for electric material ha
ling." It does not, however, sup
sede the FLM, as both batteries w
designed and built to fill out the li
of Exide-Ironclad Batteries, to m
the needs of all industrial tru
users.

The new Greater Exide-Ironcl
Battery of standard assembly w
18 cells, 21 plates, assembled in st
trays, weighs approximately 4,
pounds; is 54 1/8" long by 25 7
wide by 31 1/8" high, overall.
capacity is 1000 ampere hours,
34.4 kilowatt hours. A 24-cell si
with 21 plates per cell, has a capac
of 45.9 kilowatt hours at normal d
charge rate.

In describing the future of t
newest Exide-Ironclad Battery, W
liam Van G. Brandt, manager Ex
Motive Power Battery Sales, said

"Just as we anticipated some ye
ago a market for trucks of 8,000
10,000 pounds, we now foresee a m
ket developing, particularly in
steel industry and the automobil
dustry, for huge ram and fork tru
having a load capacity of 30,000,
000, and even 50,000 pounds. In
der to be ready for this market,
have developed the new "MEH"
ide-Ironclad Battery in four sizes
cells, 15-plates to 21-plates inclusi

and having a capacity of 700, 800, 900 and 1,000 ampere hours, respectively.

For greater capacity, we have the super Exide Ironclad Battery, FLAM-Icell, with a capacity of 1080 ampere hours.

The new MEH fills out the Exide-Ironclad line, making it possible to supply an Exide Ironclad battery of sufficient power and capacity to meet the requirements of any size and type of electric industrial truck for any job. It also enables the electric industrial truck user to obtain dependable battery power and low cost of operation, for which battery trucks are noted, regardless of whether the particular material handling job is that requiring a small truck or the huge super-trucks of 30,000 pounds or more."

Chief Engineer Byrd, of tuna clipper Liberty, using arc welder.

Arc Welder Goes Deep Sea Fishing

hen an arc welding machine goes fishing, it's news . . . particularly when the fishing expedition has as its goal a 300-ton catch of tuna from equatorial zones in the Pacific Ocean. The tuna clipper Liberty is including the arc welder in her facilities primarily for keeping important refrigerating machinery in order. Further, according to Don Byrd, chief engineer of the boat, the equipment will prove valuable in various other capacities. The General Electric single-operator D.C. welder was purchased from the Victor Equipment Company, San Francisco, California.

he Liberty is able to carry 300 tons of fish in brine, can travel at a speed of ten knots, and has a cruising range of 8000 miles. She was built by the Campbell Machine Company, San Diego, California, for Captain Frank Gonsalves, Jr.

The compactness and wide welding range of the General Electric welder were of particular importance to Chief Engineer Byrd when he selected the equipment, since space is at a premium and dependability is necessary.

Two Interesting Diesel Electric Tugs

Two very interesting tugs are under construction at the Defoe Boat & Motor Works, Bay City, Michigan, for the Moran Towing and Transportation Co. of New York. All welded steel construction and built to the highest class of the American Bureau, these tugs were designed by Tams Incorporated, New York naval architects.

Requirements of the design were: Seaworthiness for ocean operation; handiness and flexibility of power for harbor work; and draft and height limits for New York State Barge Canal operation.

The steel hulls are: 94 feet 4½ inches long; 25 feet beam; 12 feet depth at side amidships; and have a designed loaded draft of 9 feet 6 inches.

In order to maintain the required sea speed of 13 knots it is necessary to have 1000 shaft horsepower available. The plant chosen to generate and apply this power is rather unique. It consists of: 2 General Motors Vee type, eight cylinder, 2 cycle diesels, each rated 600 shaft horsepower at 750 r.p.m., and each directly connected to a General Electric 400 K.W., 250 volt, 750 r.p.m. generator and belt connected to a General Electric 25 K.W., 125 volt, 1800 r.p.m. generator for excitation and auxiliary power.

The main generators supply current directly to two General Electric 500 H.P., 1200 r.p.m. motors. Each of these motors is directly connected to one of the pinion shafts of a Farrel-Birmingham 6 to 1 reduction gear unit. The gear wheel of this unit is directly connected to the propeller shaft and drives it at 200 r.p.m. for full normal speed.

Reversal and control of propulsion motors is obtained by variation of generator voltage through cutting resistor units in or out in the exciter circuits for the fields of the main generators.

For standby purposes there is installed a Model 3-71, three cylinder, 2 cycle diesel driving a General Electric generator. This unit is self-contained with all necessary pumps, water tank, coolers, etc. mounted on one bed plate.

The propulsion motors are under control from four stations: The engine room, the pilot house, the bridge, and at the after end of the deck house. At each deck station and in the pilot house there is an operating pedestal, a controller, a speed indicator, and a set of signal lights.

From either of these stations the speed and power of the propulsion motors can be controlled with great flexibility and with exact precision.

Testing Materials for High Temperature Turbines

The finishing touches have just been added to the third of a battery of unique electric furnaces by means of which engineers at the Westinghouse Research Laboratories will study the "creep" of steel and metal alloys. The three new testing machines comprise the most elaborate creep testing apparatus in the world.

Before a piece of metal can be safely used in a modern high speed machine, such as a steam turbine, engineers must know exactly how much it will stretch or "creep" under working conditions. For example, the steam inside a turbine is so hot at 850 degrees Fahrenheit that the steel interior glows a dull red. Under the combined action of high temperature, centrifugal force, and steam impact, the grains in the metal slide; the blades creep. Turbine blades are made of alloys which will resist creep to prevent collision after a few years' use because blades are spaced only a few thousandths of an inch apart to operate efficiently.

● Metals Face Increasing Temperatures.

In the past ten years temperatures have increased radically in steam turbines. "The higher the temperature of the steam, the more electricity can be obtained from the burning of a pound of coal," explained P. G. McVetty, designer of the new testing apparatus. "But as the temperature of the steam increases the strength of the metal in the turbine decreases," he added.

However, as a result of creep tests, metallurgists have been able to develop alloys which today resist creep at 950 degrees Fahrenheit as well as the older types of metal did at 850 degrees a few years ago. "The only fundamentally sound solution to the problem presented by higher temperatures," McVetty pointed out, "is to conduct enough tests to make sure that the properties of the weakest material acceptable under the turbine engineers' specifications are known. Turbines can be built to withstand any degree of temperature provided we can find the metal alloys which will creep slowly enough."

It is not at all unusual for the engineers of the Westinghouse turbine division at South Philadelphia to ask Mr. McVetty what stress they can put on a metal so that its creep will not exceed two-tenths of one per cent in 20 years. Another way of putting this is to say that the creep would not be more than one ten-thousandth of an inch of metal a year.

● Bolts "Creep" Too.

This specification does not apply solely to blades but to casings and bolts and all other parts that will be affected by the high temperatures. If a bolt should creep enough it might relax and lose its tension.

In the past, each sample of metal was placed in an individual furnace and heated while carrying a heavy weight. Periodically over several weeks the amount of creep was measured by means of mirrors which reflected onto a scale the degree of stretch between two marks on the samples.

Such old style testers were accurate but were not designed for the day when industry required 100 or more simultaneous tests of different materials. Today, metallurgists are developing alloys for high temperature service more readily than they can be tested even with a reasonably extensive installation of the existing equipment.

● Test 180 Metal Specimens Simultaneously

Mr. McVetty, in effect, has combined 60 creep machines into a single unit. With all three of the new machines in operation, it will be possible to conduct 180 simultaneous tests. Each machine is a heavy alloy steel block housed in a three-walled cylinder taller than a man and supported on a foundation of sand. In order to retain the heat inside the furnace, the outer shell is made of concentric sheets of polished nickel and aluminum separated by powdered silocel.

● Photo-Electric Temperature Control

Three electric windings on the metal core of the furnace produ temperatures up to 1000 degre Fahrenheit and a photo-electric ce maintains the temperature within degrees or less by automatically o erating a resistance which contro the electric current. The cylinder r volves once an hour in order to di tribute the heat equally to all par of the furnace.

When all three units are in oper tion, the operator will be able "plug in" by means of a telephon switchboard and determine exactl how the heat is being distributed i side the furnace. One hundred an twenty-five pairs of wires will co nect thermocouples in the furnac with instruments for measuring an recording the temperatures.

Each heating core has 12 space for holding twelve 20-inch test samples which may be subdivided int five sections to make 60 tests. Di gages connected with compariso rods extending through the top o the furnace measure the relative vertical displacement of the rods by th samples which may be "loaded" b weights and levers to carry 50,00 pounds per square inch of metal under test.

● Measure 1/100,000 Inch Change

But for a double check, Mr. McVetty equipped the machine with circular track and a micrometer microscope called an "extensometer. A laboratory worker welds two platinum spots or targets at the top an bottom of the sample metal, scratche very fine lines on the spots and fastens the sample metal in the furnac When it is time to take a measurement of the creep, the cylindrica shell is revolved until the sample i opposite two quartz windows whic pierce the 10½ inch wall. The microscope is rolled in place on th track, peers through the quartz windows, and measures the distance between the two platinum targets. It measurements are within one one hundred-thousandths of an inc from perfection.

The engineers repeat the reading daily for approximately thre months, charting the results as gradual curve. Thus in three month they discover means of estimatin how the metal will creep during th next 20 to 30 years.

Spunyarns and Catharpins

ight of Way

I a thick pea soup fog the tramp eaer was edging ahead on a slow el up the Thames estuary. First at on the bridge was peering anxul along the port side. Suddenly, s amazement, a man appeared ang over a rail only a few yards ff is port bow.

"u * ** ass," roared the mate, W re do you think your ship's going I've got the right of way here."

"uv'ner," came back the sardonic ep. "This ain't no bloomin' ship. hi 'ere's a blinkin' light'ouse!"

---

w To Live 900 Years.

etuselah ate what he found on
h plate,
nc never, as people do now,
id e note the amount of the cal-
o e count—
e e it because it was chow.

e asn't disturbed, as at dinner
h sat,
es oying a roast or a pie,
o ink it was lacking in granular
fa
r couple of vitamins shy.

e eerfully chewed every species
of food,
nt ubled by worries or fears
st his health might be hurt by
so e fancy dessert—
d e lived over 900 years!

—Scientific American.

---

ney's Worth

criticized the sermon, Mother he organist was off key. To s nice ear the choir singing was r But were their faces red when Bill remarked, "I think it was a good show for a nickel."

● The Diluvian Mariner.

When Noah sailed the waters blue
He had his troubles same as you;
Full forty days he drove the Ark
Before he found a place to park.

● Hust a Hest

New Californian: "I stopped over in San Juan and . . ."

Old Californian: "Pardon me, but you should say San Huan. In California we pronounce our J's like H's."

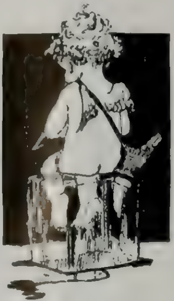
New Californian: "Well, you'll have to give me time. You see, I've been in the State only through Hune and Huly."

—El Padre.

● Some Hindu Splutta.

There was an old man from Calcutta,
Who talked with a terrible stutta;
He screwed up his face
When he tried to say grace,
And blew his false teeth in the butta.

Another old lad from Calcutta,
Used Argol as you would use butta,
It softened his snore
From a strenuous roar
To an oleaginous mutta.



● A Brain Twister.

With the six letters L-S-T-R-E-U fill the blanks in the following rhyme with seven six-letter words:

A .... sat in his ....gray
Watching the moonbeams .... play,
And thus to his flask did sing:
Thou .... the weak, thou .... the strong,
.... of the battle to thee doth belong;
John Barleycorn is king.

● The Error Erinese.

As I was crossin' the bridge I met Pat O'Brien. "O'Brien," says I, "how are you?" "Pretty well, thank you, Brady," says he. "Brady!" says I, "that's not me name." "Faith," says he, "and mine's not O'Brien."

With that we each took anither look, an' sure enough, it was nayther of us.

● Maritime Pet.

Of course you have all heard of the nice old lady whose doctor ordered her to live near the seashore. So she rang up the pet shop and tried to trade in her Pekingese for an ocean greyhound.

● A Cool Cupid.

Mary Roberts Rhinehart, so the story goes, grew weary of ending all of her novels with the commonplace English words "The End," or their equivalent, the Latin "Finis."

One day, meeting the artist Harrison Fisher at dinner, she suggested to him the need for something different in a book closure.

A few days later she received from him through the mail a sketch similar to that reproduced herewith. Mystified, she asked for an explanation.

"My dear Mrs. Rhinehart," wrote Fisher in reply, "would not this little fellow be saying, 'My Tale is Told'?"

On the Ways-

SHIPS IN THE MAKING

LATEST NEWS FROM AMERICAN SHIPYARD

Maritime Commission Awards New Contracts

The United States Maritime Commission and the Federal Shipbuilding and Dry Dock Company of Kearny, N.J., on May 9 formally signed the contract for the construction of four standard steam-propelled steel cargo vessels on which they received the award on May 5. These ships will be the first merchant cargo vessels for operation in foreign trade to be built in an American shipyard in the past sixteen years.

The Federal Company, with a bid of $1,995,000 each, or a total of $7,980,000 for the four ships on an adjusted price basis, was the lowest bidder among the major shipyards submitting proposals opened by the Commission on May 3 for the construction of a group of twelve ships. Four other vessels, which are to be diesel propelled, were awarded by the Commission to the Sun Shipbuilding and Dry Dock Company of Chester, Pa., which bid $2,075,000 each for a total of $8,300,000 for all on a fixed price basis. This contract was signed May 10.

The new vessels will be 435 feet long with a displacement of 13,900 tons and a speed of 15½ knots. All of the ships must be completed in 600 days.

The award for building the remaining four ships will be delayed, Chairman Land said, until the Commission can investigate the facilities and financial standing of the Pensacola Shipbuilding Company of Pensacola, Fla. This company, with a bid of $1,990,000 apiece on a fixed price basis, and $1,890,000 apiece on an adjusted price basis for four steam propelled vessels, was low among the bids considered by the Commissi
but it is just being organized, he st
ed, and its qualifications for a co
struction contract must be determi
ed.

New Ship Contracts Let in May

4 C-2 Standard design 15½ knot diesel engine drive cargo carriers to Tampa Shipbuilding and Engineering Company by the U. S. Maritime Commission. Total cost $7,352,652.

4 C-2 Standard design 15½ knot diesel engine drive cargo carriers to Sun Shipbuilding and Dry Dock Company by the U. S. Maritime Commission. Total cost $8,300,000.

4 C-2 Standard design 15½ knot geared steam turbine drive cargo carriers to the Federal Shipbuilding and Dry Dock Company by the U. S. Maritime Commission. Total cost $7,980,000.

1 Lighthouse tender to the Marine Iron and Shipbuilding Company of Duluth, Minnesota, by the U. S. Secretary of Commerce. Cost $190,000.

2 Lighthouse tenders to the John H. Mathis Company of Camden, N.J., by the U. S. Secretary of Commerce. Total cost $440,046.

The Commission was advised th
it could not legally consider the bi
of Hess Welded Ship & Barge Co.,
Philadelphia, Pa., Philadelphia Shi
building Co., Bristol, Pa., or P.
MacLachlan, Seattle, Wash., becau
of failure of such bidders to furni
the required bid bond. These bi
were, accordingly, rejected.

The bids of Bethlehem Shipbuil
ing Corp. were: For construction
Fore River, $2,520,000 each for fo
steam vessels on adjusted pri
basis; and for construction at Uni
Plant, San Francisco, $2,687,000 ea
for two steam vessels, adjusted pri
basis.

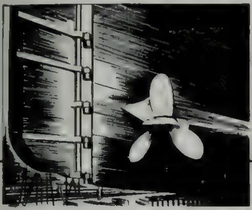
Newport News Shipbuilding a
Dry Dock Company bid (adjust
price basis) was $2,075,000 each f
four steam vessels, and $2,370,0
each for four motorships.

Lighthouse Service Contracts for Three Shi

The Secretary of Commerce h
just approved the award of contrac
for the construction of three ne
lighthouse tenders, in accordan
with the recommendation of the Co
missioner of Lighthouses, as follow
Contract for the construction of o
new ship, to the Marine Iron a
Shipbuilding Company, of Dulut
Minnesota, at a price of $190,00
contract for the construction of t
new ships, to the John H. Math
Company, of Camden, New Jersey.
a price of $440,046.

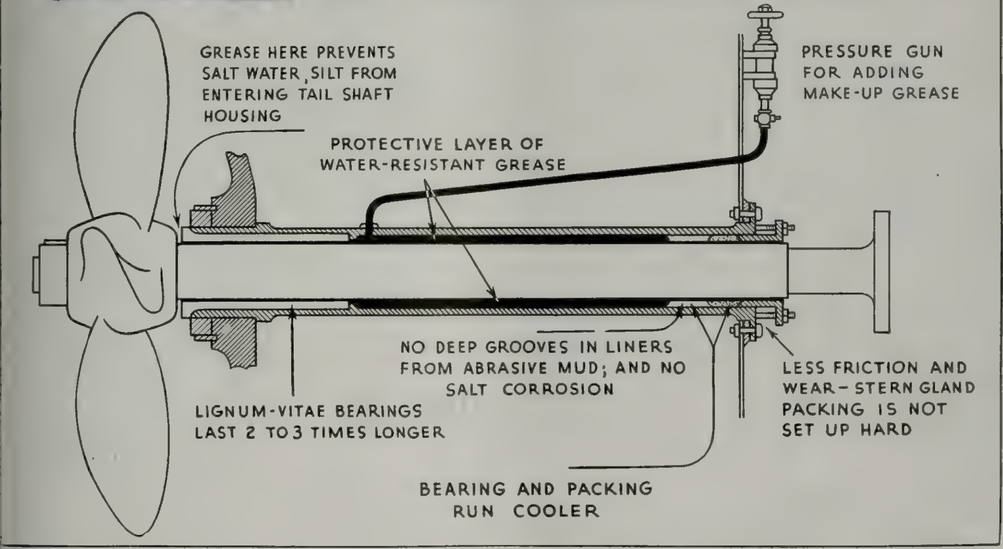
These ships will be 122 feet lon

ARE YOU STILL "LUBRICATING" TAIL SHAFTS WITH SALT AND SAND?



Shell Engineers now offer a revolutionary method of stern tube lubrication. Tail shaft wear greatly reduced. Lignum-Vitae bearings last 2 to 3 times longer

SHELL METHOD OF STERN TUBE LUBRICATION


GREASE HERE PREVENTS SALT WATER, SILT FROM ENTERING TAIL SHAFT HOUSING
PRESSURE GUN FOR ADDING MAKE-UP GREASE
PROTECTIVE LAYER OF WATER-RESISTANT GREASE
NO DEEP GROOVES IN LINERS FROM ABRASIVE MUD; AND NO SALT CORROSION
LESS FRICTION AND WEAR – STERN GLAND PACKING IS NOT SET UP HARD
LIGNUM-VITAE BEARINGS LAST 2 TO 3 TIMES LONGER
BEARING AND PACKING RUN COOLER

Whenever a tail shaft is drawn, you see the damage that salt water and sand do to liners and bearings. It's costly evidence that sea water is a mighty poor *lubricant*.

But now Shell engineers have solved this century-old problem of stern tube lubrication. Their new method of feeding a water-resistant grease to the stern tube assembly keeps the water out—lubricates the shaft with grease instead of muddy salt water.

Result: Fewer cuts and grooves in tail shafts. Bearings run cooler. Lignum-Vitae bushings last 2 to 3 times longer. Stern gland packing need not be set up tight—and therefore friction here, too, is reduced to a minimum.

Do you wonder that more ship owners and engineers are changing over to this Shell method of stern tube lubrication? On a great many ships, big and small, it has already saved thousands of dollars on replacement costs.

Find out today how little it will cost you to adopt this new method. It can be applied in a few hours—without dry-docking. Phone the nearest Shell office, or write to Industrial Lubricants Division, Shell Oil Co., Shell Bldg., San Francisco.

SHELL MARINE LUBRICANTS

27-foot beam, and will displace 342 tons in salt water. They will be driven by two multi-cylinder geared diesel engines of 200 horsepower each, and will attain a speed of ten knots. The contract price calls for acceptance of the ships by the Government at the yards of the builders.

Federal Launches Pan-New York

"Will you find your way," reads an attractive invitation issued by the Federal Shipbuilding and Dry Dock Company, "to the launching of the Pan American Petroleum & Transport Company's tanker Pan-New York?" This message is spread over three pages. The first page has a facsimile of the directional loop of a radio direction finder surrounded by the words "Will you find . . . your . . . way?" Two inside pages show a tanker silhouette on the left-hand page heading towards a refinery waterfront scene on the right, with the words "to the launching of the Pan-New York?" spread in a wide arc over the left-hand page and running onto the upper part of the right-hand page. On the latter page, in small type, upper right corner, we glean the information that this launch was at Kearny, New Jersey, at 10 A.M., May 14. Mrs. Donald J. Smith was sponsor; and Mrs. G. Franklin Bayes, matron of honor.

The sailing ship Star of Scotland on floating dock of the Los Angeles Shipbuilding and Dry Dock Company, having a rank growth of barnacles, etc., removed from her bottom.

Bids on Export Line Ships

On May 17 the Maritime Commission opened bids tendered on plan and specifications prepared jointl by the American Export Lines o New York and the Maritime Commission for new vessels to be operated on the firm's service between U. S Atlantic Coast ports and Mediterranean ports.

The subsidy contract program call for a total of ten vessels to be constructed in the next five years, fou of them in 1938. The bid under discussion is for these four ships.

Sun Shipbuilding Co. bid: $2,750,000 for one ship; $2,630,000 each fo four ships on a fixed sum basis; an $2,650,000 for a single ship, $2,530 000 each for four ships on an adjusted price basis.

Bethlehem Shipbuilding Corporation, Ltd. bid, on fixed sum basi only, $2,893,000 on a single ship, an $2,559,000 for each of four vessels Construction to be at Fore Rive yard.

New York Shipbuilding Corp., Newport News Shipbuilding & Dry Doc Company, and Federal Shipbuildin & Dry Dock Company were also bidders, but on a considerably highe range of price.

The vessels are to be 475 feet lon with a loaded displacement of 14,45 tons, a sea speed of 16.5 knots, an a cruising radius of 15,000 miles.

During a cruise port lifeboat drill aboard the Grace Line's Santa Rosa the crew tries out the new type lifeboat winch designed by the Welin Davit and Boat Company for Grace Line, to lower lifeboats on an even keel. A combination gravity fall and electric hoist winch, this unit can also be operated by hand should motor or electric current fail.

Dependable Insurance Since 1863

Fire · Automobile · Marine · Casualty · Fidelity · Surety

FIREMAN'S FUND GROUP
Fireman's Fund Insurance Company — Occidental Insurance Company
Home Fire & Marine Insurance Company
Fireman's Fund Indemnity Company — Occidental Indemnity Company

Strength Permanence Stability

New York · Chicago · SAN FRANCISCO · Boston · Atlanta

Fireman's Fund Celebrates Birthday

Metal house mark used in early San Francisco.

ome of the West's most colorful characters and episodes parade through "Seventy-Five Eventful Y rs"—a booklet recently released by Fireman's Fund Insurance Company in commemoration of its seventy-fifth anniversary.

he booklet takes the place of the regular May issue of Fireman's Fund Record, which is the oldest fire insurance house organ in the United States. The first modest issue of the Record made its appearance in January, 1878, just fifteen years after the incorporation of Fireman's Fund in the State of California on May 6, 1863.

he history of the West, and particularly of San Francisco, is closely interwoven with the history of Fireman's Fund, and the booklet faithfully portrays Pacific Coast events during the last three-quarters of a century, illustrating its pages with photographs, line drawings and reproductions of interesting historical documents.

an Francisco looked like a "permanent camp" when Captain William Holdredge, a retired skipper with the promoter's instinct, in September, 1862, conceived the idea of organizing a fire insurance company. His first effort was not successful, but by May of the following year he had interested enough financial support to launch the company with a cash capital of $200,000.

Part of the original scheme was to donate 10 per cent of the company's profits to the charitable fund of the fire department. Buildings insured in Fireman's Fund were to carry a metal firemark—the theory being that the firemen, seeing this insignia on a burning building, would redouble their efforts to extinguish the flames. This naive attempt to make charity help business and business help charity explains the choice of the company's name, and also explains the familiar trademark of a frightened child in the arms of a bearded and helmeted fireman.

Neither Holdredge nor his first directors were insurance men. Many of them were connected in some way with the San Francisco Volunteer Fire Department, and the names of several are inscribed on early California's scroll of fame.

One of them was Samuel Brannan, who came to San Francisco in 1846 with his band of armed Mormons. Some historians date the founding of the bay city with his arrival. He was the first California newspaper publisher; first leader of the famed vigilantes; California's first millionaire; first man to proclaim Marshall's great discovery of gold; first to preach a sermon in English in San Francisco; and first to perform a marriage ceremony in English. He owned property in Honolulu, traded in China and Europe, and floated a bond issue for the Mexican patriots who were trying to throw off the yoke of Maximilian. He died in 1889, in comparative poverty, on a little ranch near San Diego.

After six weeks in business the company wrote its first policy, on June 18, 1863, and the policy paid the handsome premium of $12.00 plus $1.75 stamp tax.

It did not take the company long to see that the profit-sharing plan was too heavy a burden, and within a year they made a cash payment of $5000 to the San Francisco Volunteer Fire Department, in return for which

Marine Insurance in All Phases — "All Risks" . . . Inland Marine . . . Ocean Marine

STANDARD MARINE INSURANCE COMPANY, LIMITED
NATIONAL UNION FIRE INSURANCE COMPANY
MERCANTILE INSURANCE COMPANY OF AMERICA

GEO. E. BILLINGS CO.

Pacific Coast General Agents—Richard J. Lutich, Marine Manager

GArfield 3646
308 California St.
SAN FRANCISCO

TRinity 1521
Spreckels Bldg.
LOS ANGELES

SEneca 1478
Colman Bldg.
SEATTLE

MARINE DEPARTMENT
AETNA INSURANCE CO.
QUEEN INSURANCE CO.
MARITIME INSURANCE CO., LTD.
FIDELITY PHENIX FIRE INS. CO.
Commercial Hull Dept.
AUTOMOBILE INS. CO.

Mathews & Livingston
Marine Underwriters
200 BUSH ST. SAN FRANCISCO
Offices at: Colman Bldg. - Seattle 111 West 7th St. - Los Angeles

the firemen gave a receipt releasing the company "from any claim of any name or nature from this date on unto the end of the world."

"Seventy-Five Eventful Years" shows how Fireman's Fund has been directly or indirectly affected by rapid changes in the conditions of life, industry and business—the end of the Civil War; purchase of Alaska; settlement of the West; completion of the overland railway; annexation of Hawaii; Spanish War; acquisition of the Philippines; construction of the Panama Canal; maturity and end of the clipper ship era; decline of the whaling industry; conversion of navies and merchant marine from sail to steam; development of internal combustion engines and electric drive; change from wooden hulls to hulls of steel, etc.

Fireman's Fund developed the first policy form for insuring growing grain; was the first to write automobile insurance through a nationwide agency plant, and the first to pioneer "the five point" coverage on automobiles. The booklet reviews the entrance of the company into the field of marine insurance in 1867.

Henry Dutton, a prominent "forty-niner" and vice-president of the company, had a young son just out of college. This young man, William J. Dutton, became marine underwriter. His interview for the job was short.

"What do you know about marine insurance?" asked President Staples. "Nothing whatever," replied the quaking Dutton.

"Well," said Staples, "you know as much about it as I do. Now there's only one piece of advice I'll give you. You will make mistakes, but try not to make the same mistake twice." Dutton became the fourth president of the company.

Drama entered the picture with the company's great test following the Chicago fire of 1871, when losses totaling nearly $600,000 were paid dollar for dollar within sixty days. The story of the rehabilitation of the company after the San Francisco earthquake and fire in 1906, and th settlement of 8,603 claims totalin $11,300,000, is a stirring chapter.

Fireman's Fund has written ne premiums of $465,000,000 in its sev enty-five years of activity, and pai $249,700,000 in losses. Today, witl assets of over $39,000,000, policy holders' surplus of $21,600,000, an premium income of $16,500,000, th company is represented by nearl 10,000 agencies in the United State and Canada.

In sixty-seven cities throughou the continent the company and it affiliates have a staff numberin 1590 employees.

Explosion on the Motor Tank Vessel Gulflass

An explosion occurred on board the motor tank vessel Gulflass, a vessel of 33 gross tons, while that vessel was at the Gulf Oil Co. docks at Norfolk, Va. The crew in charge of the Gulflass at the time of the explosion consisted of a licensed master and pilot and one deck hand. As a result of the explosion, one of the crew was killed, and another member of the crew seriously injured. The Gulflass itself suffered serious structural damage.

A short time previous to this disas ter, this vessel had been surveye and structural changes made an equipment added to bring the vesse up to the standard required by th recent Tanker Rules and Regulation of the Bureau of Marine Inspectio and Navigation.

This vessel was divided by bulk heads into three compartments, th two major compartments being use for the carriage of oil and for th propulsive machinery, respectively.

(Page 52, Please)

Were You Aboard!

The 9th Annual Spring Frolic

Propeller Club of California

Propeller Club of California Has Active Month

Reviewing the activities of the Propeller Club of California for the month of May is an exceptionally large assignment. In addition to the regularly scheduled luncheon gatherings the organization staged two stellar head-line events, namely the 9th Annual Spring Banquet and the National Maritime Day observance.

Capt. H. N. Gleason was introduced to the May 10th luncheon by **L. L. Westling**, member of the Board of Governors and Chairman of the Legislative Committee.

Capt. Gleason told his listeners that the shipping industry is now the heaviest legislated of all American business classifications. Moreover, shipping is the victim of legislators who know little about marine affairs, who have not at heart the proper interest in our merchant marine. "If they do have this interest at heart they have an amazing way of proving it," said the speaker. He reviewed in detail the many impractical bills which have recently been proposed by misguided zealots, pointing out that foreign regulations are usually drafted by men familiar with the practicability of their proposals.

Among the bills lately under contemplation in Washington was the proposal to extend the Social Security Act to include seagoing personnel. The Safety at Sea legislation was also detailed by the speaker who scored its impractical provisions. Capt. Gleason's talk was well received by a capacity attendance.

● BANQUET SUCCESS.

The Spring Frolic, announced by an ambitious program-entertainment committee as COLOSSAL - GORGEOUS - SPECTACULAR was held on the evening of May 18th at the Marine Exchange, California Street, in San Francisco. Three hundred and more men who came aboard were ready to add STUPENDOUS to the advance billing. The event was a tremendous success and Propellers are still gathering in groups to discuss its amazing features in glowing terms.

Imagine the entire street floor of the Merchants Exchange building devoted to the reception, refreshing and recreation of 320 Propellers and their guests! From the moment the "crew" came through the revolving door until the last soul had crossed over the gangplank homeward bound there wasn't a dull moment. Beautifully planned by **Fletcher Monson** and his eager aides we are ready to testify that San Francisco has never witnessed a more delightful, colorful frolic. Gentlemen all—first, last, and always!

Your scout saw **Stan Allen** watching all ticket and seating arrangements with his usual deft touch . . . **Mon Paulsen** as chief Host in the refreshment department which elaborate detail was successful in his efficient hands . . . **Russ Pratt** as a mighty capable maitre d'Hotel (and it was Russ who organized that 145-pound pressure sounding-off whistle) . . . Dick Glissman as the master of entertainment who kept a 2-hour show moving along on greased bearings!

Then there was **C. M. "Dad" LeCount**, our president who greeted the gang with a nicely controlled forensic effort . . . **Harry S. Scott** of the Marine Exchange who told us to make ourselves right at home . . . **Superintendent Seville** of the Merchants Exchange who rang the historic Vigilantes alarm-bell!

The setting for the event was a happy choice. The photograph reproduced on the preceding page will bear this out—and you, gentle reader, may see for yourself. An annotation on the attractive program of the evening read:

"We're here because . . . For over seven decades San Francisco maritimers, men of commerce . . . men of the sea have met on this historic site. The Marine Exchange . . . envisioned by the '49ers . . . hallowed by the memories of the picturesque yesteryear . . . of Telegraph Hill flashing its ingenious signals, antedating the telegraph, the telephone . . . 'Change was moved from 'Lime Juice' Corner (Washington and Battery Streets) to this present site in '66. A toast to t men who built our port . . . the m who have trod this ground . . . as meet in comradeship tonight."

● MARITIME DAY.

The Propeller Club observed Na ional Maritime Day on May 24 at t Commercial Club. The luncheon, a tended by about 500 men, was joint sponsored by the Propeller Club, t San Francisco Junior Chamber Commerce, and the Foreign Tra Association.

Guest speakers of the day were i troduced by **Joseph A. Moore, J** who heads up the Marine Committ of the Junior C. of C. "Young Jo made a very commendable job of and we were proud to reflect that is also a Propeller.

Ralph W. Myers, president of t Shipowners Association of the Pa fic Coast, spoke at the invitation the Propeller Club. **Dean J. Hu Jackson**, of the Graduate School Business at Stanford, was present as speaker by the Junior Chamber

Speaker Myers has the faculty making his audience perch on t edge of their chairs speculating "What's coming next!" His style delivery is unique . . . and his r marks always sparkle with the typ cal Myers humor.

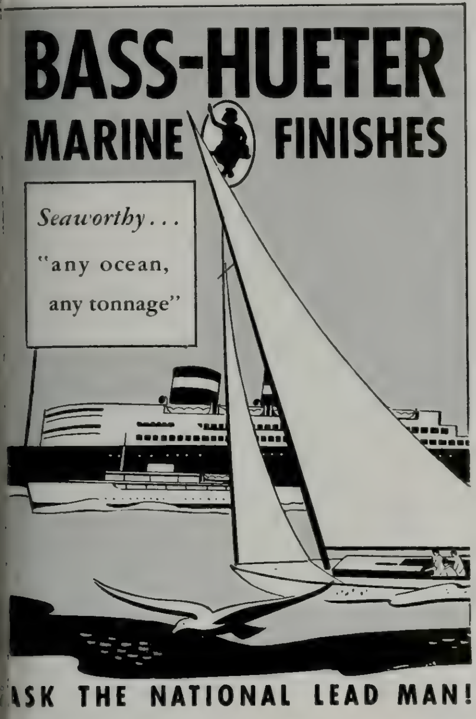
Concerted effort was his them He deplored the prevalence of "po tics" in the present administration ship operating regulations and po cies. "The Maritime Commission law cannot include men who ha had direct or indirect connecti with the steamship business thr years previous." He emphasized th practical knowledge is preferable theory or book instructions.

The inadequacy of our mercha tonnage was declared and the spea er reminded us that foreign botton were necessary as colliers when A miral Bob Evans brought his Whi Navy round the Horn three sco years ago.

"Situations of this sort do n speak well for our nation, which r presents the largest export countr in the world.

"By chance in 1926, when the Bri ish had their coal strike, we had ve sels to put into foreign trade; an even though it was an emergenc the value of America's readiness t

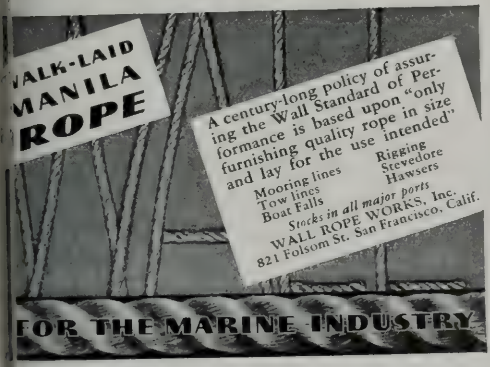
(Continued on Page 59)



BASS-HUETER MARINE FINISHES

Seaworthy . . .
"any ocean,
any tonnage"

ASK THE NATIONAL LEAD MAN!



VALK-LAID
MANILA
ROPE

A century-long policy of assuring the Wall Standard of Performance is based upon "only furnishing quality rope in size and lay for the use intended"

Mooring lines
Tow lines
Boat Falls

Rigging
Stevedore
Hawsers

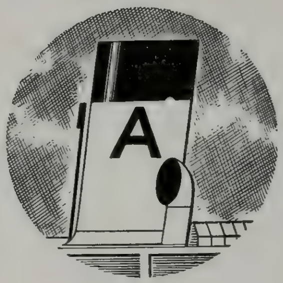
Stocks in all major ports
WALL ROPE WORKS, Inc.
821 Folsom St. San Francisco, Calif.

FOR THE MARINE INDUSTRY

Your Home IN PORTLAND
Hotel MULTNOMAH
600 OUTSIDE ROOMS • SENSIBLE RATES

★ ★ ★

ASSOCIATED
SERVES
THE PACIFIC



CONVENIENTLY available at Pacific ports — for local craft and for freight and passenger lines — are Associated's *proved quality* Marine Products. Call your local Associated representative for complete information.

CONVENIENT
MARINE DISTRIBUTING STATIONS
AT
SEATTLE • SAN DIEGO • PORTLAND
SAN FRANCISCO • OAKLAND • SAN PEDRO
TACOMA • HONOLULU, T. H. • MANILA, P. I.

ASSOCIATED DIVISION

TIDE WATER ASSOCIATED
OIL COMPANY

★ ★ ★

Tanker Explosion

(Continued from Page 46)

The Gulflass was equipped with a four-cylinder, four-cycle Lathrop gasoline engine of about 75 horsepower, started and controlled from the pilot house, by means of an electric starter wired to the pilot house, where there was an electric switch. This switch was connected with the electric starting motor located at the base of the engine. The source of power for the operation of the starting motor was furnished by suitable wet storage batteries which were located on the engine floor level. The investigation shows that the engine was equipped with the necessary back fire flame arrester at the carburetor, and a spark arrester on the exhaust pipe, as required by the Rules and Regulations.

The gasoline tank for the operation of the engine was located on the after main deck. This tank had been recently moved from the lower after hold. The gasoline to the engine was supplied by a gravity line with a cut-off valve at the tank and one near the carburetor. The Gulflass was of a bilge keel construction, with floor boards in the engine room, which boards were removable for examination of the bilge. She was equipped with one bilge pump that was connected to the auxiliary engine, and had in addition, one hand operated bilge pump with brass suction lines leading to each compartment in the vessel. There was a hatch leading to the pilot house from the engine room, and a second hatch leading to the main deck outside the pilot house. These hatches were provided with the usual gratings and covers.

Just prior to this explosion the Gulflass was being operated on a less than 13-hour basis, with a two-man crew. When the day's work had been completed, the pilot-house windows were closed and the pilot-house doors shut and locked, and the gratings over the engine room closed down and the engine room air ports secured. While the ship was laying alongside the dock, and after the crew had left for the night, the yard watchman observed this vessel at different times during the night while making his rounds. In the morning when the boat's crew returned, the pilot house was opened, the gratings taken off, the air ports opened, and the routine operations commenced. However, it was ascertained during the investigation that there was no general practice to open the air ports before the engine was started.

At about 7:30 a.m., April 2, the crew of the Gulflass went on board. The deck hand opened the pilot house door, and threw in the starter switch without opening the air ports and scuttles to the engine room. As the starter did not function, he called to the master, then opened the scuttle and went into the engine room through the hatch in the floor of the pilot house, to see what was wrong with the starter. He testified that he smelled no unusual gasoline fumes, and after he had checked the we to the starter, he went back into the pilot house and threw the switch again.

When the switch was thrown the second time there was a violent explosion. The deck of the Gulflass was torn off almost completely, and the members of the crew were thrown into the water. The master was brought ashore unconscious and did not recover. The deck hand was seriously injured, although not seriously burned.

The board which investigated the incident arrived at the conclusion that the explosion was caused by the ignition of gaseous fumes in the engine room by a spark which developed when the starter switch was thrown in. They found that had the engine hatch covers been removed, and the air ports opened, which should be ordinary practice for the crew of any vessel of this type, that no explosion should have occurred.

(Bureau of Marine Inspection and Navigation Bulletin.)

Improved Foam Making Water Stream Nozzle

A larger capacity Phomaire Play Pipe Model PP24, that makes 500 to 750 gallons of fire-smothering foam per minute and produces 350 gallons of foam from only one gallon of Promaide solution, has been announced by the Pyrene Manufacturing Company.

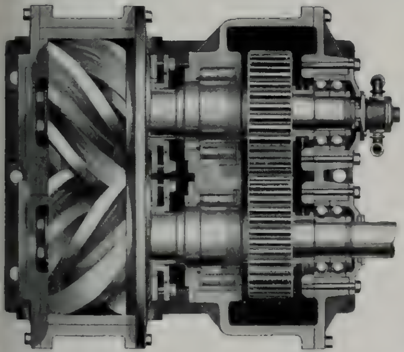
Model PP14 Phomaire Play Pipe was placed on the market more than a year ago. It converts a water stream into a foam stream by mechanical rather than chemical action. This larger size almost doubles foam production capacity of the smaller model. When the Phomaire Play Pipe is connected to a hose line and the water is turned on, Phomaide and air are drawn into the water stream to form foam. Operation is practically fool-proof, for there are no complicated preliminaries and no confusing adjustments. Only one person is required to handle the play pipe. Operation may be continued indefinitely by merely pouring additional solution into a knapsack carried on the operator's back.

Water at 75 pounds pressure or more may be pumped from suction, hydrant or water tank. Only 35 to 40 gallons are required per minute, making this method practical where the water supply is limited, or for use on booster tank or booster pump. In addition to the foam stream for fighting flammable liquid fires a water stream for extinguishing any lingering fire in ordinary combustibles may be utilized by simply closing the cock and cutting off the supply of foam-making solution.

The manufacturers claim that the records coming in from all parts of the United States testify that the flexibility and fire-fighting efficiency of this new Phomaire Play Pipe establishes it as one of the most important advances in modern fire-fighting methods in recent years.

BIRD-ARCHER CO. of Calif., Inc.
BOILER WATER TREATMENT
Specialists in Marine Feed Water Problems
We have successfully treated and serviced the boilers of every new high pressure steamer built for Pacific Coast operation in recent years.
"SERVICE BACKED BY EXPERIENCE"
Seattle
Portland
19 FREMONT STREET, SAN FRANCISCO
Wilmington
Honolulu
Agents for "BACITE" Cold Set Cement for the insulation of living quarters aboard ship.

THE LABEL
"AMERICAN MARINE PAINT"
SIGNIFIES QUALITY
FOR ALL MARINE COATINGS
FOR BOTTOMS { **GERMICIDE COMPOSITIONS** } FOR STEEL HULLS
{ **CAPE COD COPPER PAINTS** } FOR WOODEN HULLS
FOR DECK AND ENGINE ROOM REQUIREMENTS { **A proper and efficient coating for all surfaces including such outstanding leaders as HI-TEX ENAMELS and ALL-PROOF VARNISH. Both built for marine use—they are durable—fast drying—weather resisting and noted for their retention of gloss and color.**
AMERICAN MARINE PAINT CO.
SEATTLE SAN FRANCISCO WILMINGTON



KINNEY HELIQUAD MAIN CARGO PUMPS
—for barge and tanker service
BEARINGS AND TIMING GEARS OUTSIDE PUMP CHAMBER
These pumps have bronze cylinder and head liners and are unusual in the rotary pump field in that all bearings and timing gears are entirely outside of the pump chamber and yet have only two stuffing boxes instead of the usual four.
Bearings are designed to keep the rotors central in the pump housing, regardless of the position of the boat. This prevents metallic endwise contact.
For more information and prices, write:
KINNEY MANUFACTURING CO. 3554 WASHINGTON ST., BOSTON, MASS
King-Knight Co. SAN FRANCISCO New York Chicago Philadelphia Los Angeles Dallas 1333 Santa Fe Ave. LOS ANGELES

APT. GEORGE W. YARDLEY s MOURNED.

s we go to press the sad news hes us that **Captain George W. dley,** master of the President ver before the catastrophe that ll her on Hoishoto Island, passed y on May 30 as a result of plications resulting from his vessel loss.

wo months ago Capt. Yardley rried Mrs. Gertrude Adams of nont, and had made plans to live e in retirement. The widow, his mother, two sons and three sisters survive him.

● DID YOU KNOW?

That in 1902 **E. V. ("Gene") Winter,** well known marine equipment man of San Francisco, was in the schooner Robert Dollar (later the Fair Oaks) as Second Engineer under William Perow, who was Chief Engineer. Mr. Perow is now Pacific Coast marine superintendent for the Luckenbach Steamship Company. . . .

In 1898, when the Spanish American war was declared, Winter was in the City of Sydney (old Pacific Mail Line) and Captain A. F. Pillsbury was master. The City of Sydney had been commandeered to carry troops from San Francisco to Manila. En route the famous vessel called at Guam and captured the island and made prisoners of the garrison. The cruiser Charleston, steamer Australia and the City of Pekin were in the convoy. After the Guam conquest these vessels laid off Cavite until the fall of Manila.

Building in American Yards

Pacific Coast

BETHLEHEM SHIPBUILDING CORPORATION, LTD.
(Union Plant)
San Francisco

NEW CONSTRUCTION: **Hull 5355—McCall (DD400).** Launched November 20, 1937; completion date March 1, 1938; **estimated delivery date June 15, 1938.**

Hull 5356 — Maury (DD401); launched February 14, 1938; completion date about August 15, 1938. Two 1500-ton destroyers for U. S. Navy; length, 341′ 3⅝″; beam, 35′ 6⅛″; depth, 19′ 8″. Cost $3,675,000.

DRYDOCK AND ROUTINE REPAIRS: **M. S. Olinda, M.S. Hoyanger, W. S. Rheem, Emergency Aid, M.S. China, Knud Rasmussen, Chipana, Barge No. 1 (Shell Oil Co.), W. H. Berg, Manulani, M.S. Bralanta, Peter Lassen, Cuzco, U.S.C.G.C. Shawnee, Lurline, M.S. New Zealand.**

FELLOWS & STEWART, INC.
Wilmington, Calif.

NEW CONSTRUCTION: **Contract No. 644, 65 foot combined passenger and party boat. Completed May 1, 1938.**

Contract No. 671, 37 foot auxiliary marconi sloop. Completion date about July 15, 1938.

DRYDOCK AND ROUTINE REPAIRS: **Cannery tender Progress; dredge tender Jean; purse seiners Liberty Bell, Ocean Gift, Gallant and Infallible; yachts K'Thanga and Stranger; glass bottomed boats Phoenix and Princess. 52 smaller yachts and cruisers for miscellaneous overhaul.**

GENERAL ENGINEERING & DRY DOCK CO.
Foot of Fifth Avenue
Oakland, Calif.

DRYDOCK AND ROUTINE REPAIRS: **W. R. Chamberlin, Jr., Tug Despatch No. 3, Standard No. 1, Richmond, Tug Slocum, Tug Basalt No. 1, M.S. Knute Nelson, Midway, Malama, Tug Virgil Bogue, Ferry Issaquah, Tug Arabs.**

HARBOR BOAT BUILDING CO.
Berth 264, Fish Harbor
Terminal Island, Calif.

DRYDOCK AND ROUTINE REPAIRS: **Tuna boat Chicken of the Sea; purse seiners New Conte Di Savoia and Sea Pride.**

HONOLULU IRON WORKS
Honolulu, T. H.

DRYDOCK AND ROUTINE REPAIRS: **Dickenson, Point Vincente, Steel Mariner, President Harrison, Kamchatneft.**

LAKE WASHINGTON SHIPYARDS
Houghton, Wash.

DRYDOCK AND ROUTINE REPAIRS: **Coast Guard Onondaga, U. S. Fornance.**

LOS ANGELES SHIPBUILDING & DRY DOCK CORP.
Los Angeles Harbor
San Pedro, Calif.

DRYDOCK AND ROUTINE REPAIRS: **El Capitan, Sch. Lottie Carson, Golden Dragon, Yt. Maria Delores, Tug Captain William, F.B. Santa Cruz, M.V. Sapporo Maru, Golden Mountain, Associated Oil Barge No. 8, M.V. Capella, Lurline Burns, Yt. Volador, Avalon, Lochgoil, Arcata, W.R. Chamberlin, Jr.**

MARE ISLAND NAVY YARD
Mare Island, Calif.

NEW CONSTRUCTION:

Sturgeon, Submarine (SS187); keel laid October 27, 1936; launching date March 15, 1938; estimated delivery September, 1938.

Swordfish, Submarine (SS193); keel laid October 27, 1937; estimated delivery date August 1, 1939.

Order received for construction of two harbor tugs, YT 133 and YT 134, October 7, 1937.

Order received for construction of garbage lighter (YG21), dated February 8, 1938.

DRYDOCK AND ROUTINE REPAIRS: **Quincy, Chandler, Hovey, Long, Southard, Reuben James, Goff, Relief, Bridge, Sonoma, Pike, Shark.**

THE MOORE DRY DOCK CO.
Oakland, Calif.

DRYDOCK AND ROUTINE REPAIRS: **Golden Cross, Solana, Santa Monica, Edgar Luckenbach, Silverado, Floridian, H. T. Harper; Purse Seiners Anadir, Marettimo, Sea Queen, and New Deal; Charlie Watson, California, Transport Grant, Ohioan, Maunalei, Frances, Patterson, Blue Water, Mirrabooka, Gracie S., Hawaiian, Shasta Daphne, Lena Luckenbach, Sacrament Constance Chandler, Golden Mountai Grena, Virginian, W. S. Miller, Sa Felipe, President Cleveland, Samoa, S G. Hindes, Delftdyke, Paul Shoup, Dakotan, Tug Fearless, El Commodore Silverash, Brunswick, Redwood, Modjokerto, Oakland, Emidio, Silvermaple Nevadan, Falsterboro, Alabaman Brunswick.**

THE PUGET SOUND NAVY YARD
Bremerton, Washington

NEW CONSTRUCTION:

U.S.S. Wilson (Destroyer No. 408) standard displacement, 1500 tons; kee laid March 22, 1937.

U.S.S. Charles F. Hughes (Destroye No. 428); standard displacement 160 tons; order placed by Navy Departmen December 7, 1937.

DRYDOCK AND ROUTINE REPAIRS: **Colorado, Idaho, Mississippi Arizona, San Francisco, Heather.**

TODD SEATTLE DRY DOCKS, INC.
Harbor Island
Seattle, Wash.

DRYDOCK AND ROUTINE REPAIRS: **Tug Active, Aleutian, Winona Dellwood, West Nilus, Cuzco, Orsego M.S. Standard Service, Chippewa, M.S Klahanie.**

WESTERN BOAT BUILDING CO., INC.
2505 East 11th Street
Tacoma, Wash.

NEW CONSTRUCTION:

Hull No. 131, purse seine fishing boat, 78′x20′x9′; 200 H.P. Atlas engine; **launching date May 1, 1938.**

Hull No. 132, 50′ pick-up fishing boat for New England Fish Company. Kee laid March 12, 1938.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE CO.
Pittsburgh, Pa.

NEW CONSTRUCTION: **Five cargo barges** 132′ x 35′ x 10′ for Campbell Transportation Co., Pittsburgh, Pa. **Delivery dates May, 1938 to September, 1938.**

903 FIFE BLDG.
1 DRUMM ST.

THOMAS A. SHORT

Successor to

C. V. LANE

Marine Representative:
Thos. A. Short,
1 Drumm Street, San Francisco

HYDE STEERING GEARS
HYDE WINCHES
HYDE WINDLASSES
HYDE CAPSTANS
HYDE MANGANESE BRONZE PROPELLERS & CASTINGS
A. B. SANDS & SON CO., PLUMBING FIXTURES
SMOLENSKY NOISELESS CHECK VALVES
BACHARACH INDUSTRIAL INSTRUMENT COMPANY
DIEHL MFG. CO. FANS, MOTORS, GENERATORS
SUBMARINE SIGNAL COMPANY FATHOMETER
COLORED CRAYONS
METAL WORKERS' CRAYONS
WELIN QUADRANT AND SHEATH SCREW DAVITS
MACLACHLAN GRAVITY DAVITS
LIFEBOAT WINCHES
METALLIC LIFEBOATS AND LIFERAFTS
SHORT OIL SEPARATOR
WILLIAM W. NUGENT & CO., OIL FILTERS
U. S. METALLIC PACKING
CONSOL RUST REMOVER
CONSOL RED and BLACK
HASKELITE—PHEMALOID
PLYMETL ORNAMENTAL PANELS
B. F. GOODRICH CUTLESS RUBBER BEARINGS
MEEHANITE CASTINGS—PISTON RING STOCK, BURNER CONES, ETC.
R. P. ADAMS POROUS FILTERS
SHORT OIL DETECTING SERVICE FOR PROTECTING BOILER FEED WATER AND FUEL OIL HEATERS

Hyde Windlass Company

Steering Gears, Windlasses, Capstans, Bronze Propellers —as installed on America's finest ships.

Bath, Maine

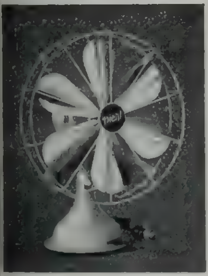
Pacific Coast Representative:
Thos. A. Short, 1 Drumm Street, San Francisco

Inter-Coastal Paint Corporation

SAN LEANDRO, CALIFORNIA

Originators and sole manufacturers of CONSOL both plain and in colors. A conditioning solution for metal surfaces that have become corroded. Not only a scale remover but a preservative as well. Gives excellent results when applied to boottop belt, hull, holds, bilges, tank tops, chain lockers, ventilator trunks, decks and so forth. Is non-inflammable and contains no acids or chemicals that are injurious to men or metal.

Marine Representative
Thos. A. Short, 1 Drumm Street, San Francisco

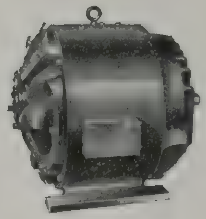


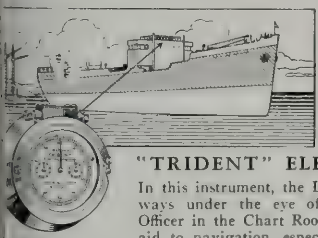
Marine Motors, Generators and Ventilating Equipment

DIEHL MANUFACTURING COMPANY

Electrical Division of
THE SINGER MANUFACTURING CO.
Elizabethport, New Jersey

San Francisco Representatives:
MARINE ELECTRIC CO. — Desk and Wall Fans
THOMAS A. SHORT — Motors, Generators, etc.





New Building!

Specify WALKER'S

"TRIDENT" ELECTRIC LOG

In this instrument, the Log reading is always under the eye of the Navigating Officer in the Chart Room. An invaluable aid to navigation, especially at night, or in fog. Suitable for all classes of vessels.

CCURATE
RELIABLE
f all Nautical
trument Dealers

Thos. Walker & Son, Ltd.,
58, Oxford Street, Birmingham, Eng.

Contributing to your overhead economies!

PLYMOUTH ROPE . . . offers longer life and greater dependability in hard service because of its unsurpassable QUALITY

PLYMOUTH 1824

PLYMOUTH CORDAGE COMPANY
NORTH PLYMOUTH • MASS

THE AMERICAN SHIP BUILDING COMPANY

Cleveland, Ohio

NEW CONSTRUCTION: **Two bulk lake freighters** 610′ x 60′ x 32′ 6″; 2,000 I.H.P. geared turbine, water tube boilers, 400 lbs. pressure, electric auxiliaries; for Pittsburgh Steamship Company. Keels laid June 21, 1937; and July 6, 1937; launching dates November 10 and December 2, 1937; **delivered May 15, 1938.**

BATH IRON WORKS

Bath, Maine

NEW CONSTRUCTION: Hulls Nos. 161, 162, and 163; **DD394 Sampson, DD395 Davis** and **DD396 Jouett**; Three 1850-ton destroyers for U.S. Navy; date of contract September 19, 1935. Keels laid, No. 163, March 26, 1936; No. 162, July 28, 1936; No. 161, April 8, 1936; No. 161 launching date April 16, 1938; others indefinite; **estimated delivery dates June**, August and October, 1938, respectively.

Hulls Nos. 170-171, DD409, Sims, and DD410, Hughes, two 1500-ton destroyers for U. S. Navy; contract date October 12, 1936; keels laid July 15 and September 15, 1937, respectively; launching dates, indefinite; delivery dates April, 1939, and June, 1939, respectively.

Hulls Nos. 177 and 178, DD423 and DD424, two 1620 ton destroyers for U. S. Navy. Contract date September 30, 1937; delivery dates April and June, 1940, respectively.

BETHLEHEM SHIPBUILDING CORPORATION

Fore River Plant,
Quincy, Mass.

NEW CONSTRUCTION:

CV7, Wasp, Airplane Carrier for U.S. Government; keel laid April 1, 1936; estimated launching date November, 1938.

Hulls Nos. 1467, 1468, 1469, three passenger and freight steamers for Panama Railroad S.S. Co.; 486 feet x 64 feet x 38 feet 6 inches; 16½ knot speed. Keels laid Nos. 1467 and 1468, October 25, 1937; No. 1469, November 15, 1937; estimated launching dates October and December, 1938, and February, 1939.

Hulls Nos. 1470 and 1471, two 1500 ton destroyers for U. S. Government; delivery dates March, 1940 and May, 1940.

BETHLEHEM SHIPBUILDING CORPORATION

Sparrows Point Plant
Sparrows Point, Md.

NEW CONSTRUCTION:

Four 13,000 deadweight ton steam turbine driven tankers for Standard Oil Co. of N. J.; length 442′, beam 64′, depth 34′ 10″, gross tonnage 7,600, speed 12 knots. Esso Baton Rouge launched November 13, 1937. R. W. Gallagher launched January 22, 1938.

One tanker for Texas Co.; about 13,000 deadweight tons; steam turbine.

Hull No. 4334; one 13,000 dwt. oil tanker for Union Oil Co. of Calif. Contract signed March, 1938.

Hulls Nos. 4329, 4330, 4331; three 16,300 dwt. ton tankers for Standard Oil Co. of N. J.; 18 knots speed. Contract signed January 3, 1938.

Hulls Nos. 4332 and 4333; two 16,000 dwt. tankers for Socony Vacuum Oil Co. Contract signed February, 1938.

BOSTON NAVY YARD

Boston, Mass.

NEW CONSTRUCTION:

DD402, Mayrant, and DD403, Trippe, two light destroyers for United States Navy; LPB 334′; beam 35′6″; depth 19′ 8″; keels laid April 15, 1937; **launching date May 14, 1938;** estimated delivery dates August, 1939 and October, 1939, respectively.

DD415, O'Brien, and DD416, Walke, two destroyers; LBP 341′, beam 36′, depth 19′8″; keel laying date **June 1, 1938;** delivery date 1940.

DD425, Madison, and DD426, Lansdale, two destroyers; 341′0″ x 36′0″ x 19′8″. Keel laying date December 1, 1938; launching date November 1, 1939; delivery date 1940.

One harbor tug for U. S. Navy; 98′0″ LBP x 24′0″ x 13′6″; keel laid March 28, 1938; **launching date June 6, 1938;** completion date September 15, 1938.

BROOKLYN NAVY YARD

Brooklyn, N.Y.

NEW CONSTRUCTION:

CL 48, **Honolulu,** light cruiser; L.B.P. 600′; beam 61′8″; standard displacement 10,000; geared turbine engines; express type boilers; keel laid September 10, 1935; launched August 26, 1937; estimated delivery, August 1, 1938.

CL 50, **Helena,** light cruiser; L.B.P. 600′; beam 61′7¾″; standard displacement 10,000; geared turbine engines; express type boilers; keel laid December 9, 1936; estimated launching date January 9, 1939; estimated delivery January 2, 1940.

BB 55, **North Carolina,** battleship; L.B.P. 714′ 0″; beam to outside armor 108′ 0″; std. displ. 35,000 tons; geared turbine engines; express type boilers. Keel laid October 27, 1937; estimated launching date May 1, 1940; contract delivery September 1, 1941.

CHARLESTON, S. C., NAVY YARD

Charleston, S.C.

NEW CONSTRUCTION:

Order placed for **one harbor tug;** LOA 124′ 9″, length between perpendiculars 117′, breadth, molded, 28′, depth, molded, 16′; keel laid August 2, 1937; launched March 7, 1938.

Order placed for **one harbor tug;** LOA 110′ 3″; LBP 98′ 0″; breadth 24′ 0″; depth at side amidships 13′ 6″. No dates set.

Order placed for **one harbor tug;** 65 feet long.

DEFOE BOAT & MOTOR WORKS

Bay City, Mich.

NEW CONSTRUCTION:

One diesel yacht, powered by 1,0 h.p. Winton engines; 143′ long, beam; steel construction. For Cox a Stevens, New York, N.Y. **Delivered M 1, 1938.**

Two diesel electric towboats 94′x2 steel construction; powered by 10 S.H.P. General Motors engines. For Ge eral Motors Sales Corp. Delivery da July, 1938.

Hulls Nos. 72 and 73; two die electric harbor cutters for Coast Guar 110′x26′6″; powered by 1000 S.H. General Motors engines; steel constru tion. Delivery date April, 1939.

One diesel yacht 49′ 6″ x 11′ 6″ f A. J. Fisher, Detroit, Mich. Power by 300 S.H.P. Gray conversion of Ge eral Motors engines; wood constr tion. **Delivery date June 1, 1938.**

THE DRAVO CORPORATION

Engineering Works Division
Pittsburgh, Pa., and Wilmington, De

NEW CONSTRUCTION:

Hulls Nos. 1440-1444; five type W welded steel coal barges 175′ x 26′ 10′8″; for stock; 2360 gross tons.

Hull No. 1452; one welded steel barge 195′ x 35′ x 9′6″, for stock; 4 gross tons.

Hulls Nos. 1453-1454; two 1200 c yd. welded steel dump scows 206′ x 4 x 14′, for Merritt-Chapman & Sco Corp.; 2092 gross tons.

Hulls Nos. 1455-1456; two weld steel coal barges for stock; 1346 gro tons.

Hulls Nos. 1457-1461; five weld cargo barges 280′ x 47′ x 11′, for I land Waterways Corp., 7220 gross ton

Hulls Nos. 1462-1465; four weld cargo box barges 100′ x 26′ x 6′6″ f stock; 660 gross tons.

Hulls Nos. 1466-1475; ten weld W-4 coal barges 175′ x 26′ x 10′ 8″ f stock; 4720 gross tons.

This makes a total of 29 hulls with total gross tonnage of 18,887 tons.

ELECTRIC BOAT CORP.

Groton, Conn.

NEW CONSTRUCTION:

Hull No. 27, Seal, SS183, standar displacement, 1450 tons; keel laid Ma 25, 1936; launched August 25, 1937; d **livered April 30, 1938.**

Hull No. 28, Skipjack, SS184, stan ard displacement, 1450 tons; keel la July 22, 1936; launching date Octob 23, 1937; delivery date July, 1938.

Hull No. 29, Sargo (SS188); stan ard displacement 1450 tons; keel la May 12, 1937; **launching date June 1938;** delivery date February, 1939.

Hull No. 30, Saury (SS189); stand ard displacement 1450 tons; keel la June 28, 1937; launching date Augu 29, 1938; delivery date April, 1939.

Hull No. 31, Spearfish (SS190); stan dard displacement 1450 tons; keel la ing date September 9, 1937, launch

PLANT

LANT RUBBER & ASBESTOS WORKS

SALES OFFICES
SAN FRANCISCO LOS ANGELES
OAKLAND WILMINGTON

FACTORIES
SAN FRANCISCO LOS ANGELES
REDWOOD CITY

ASBESTOS SUPPLY COMPANY
DISTRIBUTORS AND APPLYING CONTRACTORS
PORTLAND SEATTLE TACOMA SPOKANE

Matson Line to Hawaii

NEW ZEALAND · AUSTRALIA via Samoa · Fiji

S.S. LURLINE · S.S. MARIPOSA · S.S. MONTEREY · S.S. MATSONIA

Hawaii's blue skies—scampering surf—unfettered breezes . . . are all irresistible. Frequent sailings from San Francisco. Hotel reservations at Royal Hawaiian or Moana at Waikiki are made at the same time as steamer bookings—a distinct convenience to Matson travelers.

Fares: *(each way) California to Honolulu*
FIRST CLASS *from* $125 CABIN CLASS *from* $85

MATSON SOUTH PACIFIC CRUISES to New Zealand and Australia. *Personally-escorted,* every 4 weeks. 48 days; 17,000 miles; 12 shore excursions. All-inclusive-cost, First Class, complete cruise, from $650 *for certain Summer sailings.*

SHIPPERS: The *Lurline* and *Matsonia* provide swift freight service to Hawaii, with modern refrigeration facilities. The *Mariposa* and *Monterey* continue through to New Zealand and Australia via Samoa and Fiji. Also regular and frequent freighter service from Pacific Coast ports.

Details from Travel Agents or: **Matson Line - Oceanic Line**
San Francisco · Los Angeles · Seattle · San Diego · Portland

FRANCE

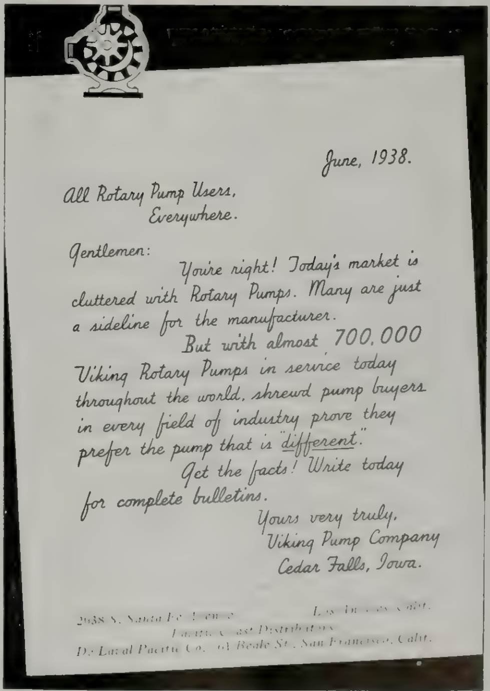
TRADE MARK

"Thirty-Nine Years Satisfactory Performance"

Manufactured exclusively by

FRANCE PACKING COMPANY
Main Office and Factory
TACONY, PHILADELPHIA

Represented by
SAN FRANCISCO—HERCULES EQUIPMENT & RUBBER CO.
550 - 3rd Street—EXbrook 2575
SEATTLE—GUY M. THOMPSON
1241 Railroad Ave., South—Phone MAin 1870
PORTLAND—E. B. HUSTON
127 S. W. First Ave.—Phone ATwater 6754



June, 1938.

All Rotary Pump Users,
Everywhere.

Gentlemen:

You're right! Today's market is cluttered with Rotary Pumps. Many are just a sideline for the manufacturer.

But with almost 700,000 Viking Rotary Pumps in service today throughout the world, shrewd pump buyers in every field of industry prove they prefer the pump that is "different."

Get the facts! Write today for complete bulletins.

Yours very truly,
Viking Pump Company
Cedar Falls, Iowa.

2038 S. Santa Fe Avenue Los Angeles, Calif.
Pacific Coast Distributors
De Laval Pacific Co. 61 Beale St., San Francisco, Calif.

ing date October 29, 1938; delivery date June, 1939.

Hull No. 33, Seadragon (SS194); 1450 tons; keel laying date April 18, 1938; delivery date December, 1939.

Hull No. 34, Sealion (SS195); 1450 tons; **keel laying date June 15, 1938;** delivery date February 1940.

THE FEDERAL SHIPBUILDING AND DRYDOCK COMPANY
Kearny, N. J.

NEW CONSTRUCTION:

Three destroyers, **DD397 Benham, DD398 Ellet and DD399 Lang,** 1500 dis. tons; **estimated launching** April 16, **June 11,** and August 1938; keels laid DD397, September 1, 1936; DD398, December 3, 1936; DD399, April 5, 1937.

Two destroyers, DD411 Anderson and DD412 Hammann; keels laid November 15, 1937 and January 17, 1938, respectively.

Hulls Nos. 149-150, two 12,900 ton tankers for Pan American Petroleum & Transport Co.; 440′ B.P. x 66′ 6′ x 34′ 6″, 450′ OA.; Isherwood Arcform design of hull form and longitudinal hull framing. Keels laid November 15, 1937 and January 10, 1938 respectively; **estimated launching dates May 14** and July, 1938; estimated completion date October, 1938.

Hulls Nos. 151, 152, and 153, three tankers for Standard Oil Co. of New Jersey.

INGALLS IRON WORKS CO.
Birmingham, Ala.

NEW CONSTRUCTION: **One 15-ton derrick boat hull** for U.S.E.D.; **launching date about June 1, 1938.**

Two diesel dredge tenders 63′ x 15′ 6″ x 6′3″ for U. S. Engineer Office, Memphis, Tenn. Launching date about September 10, 1938.

Ten hopper type cargo barges 280′ x 48′ x 11′ for Inland Waterways Corp. **Launching dates approximately June to October, 1938.**

JAKOBSON & PETERSON, INC.
Brooklyn, N.Y.

NEW CONSTRUCTION:

Hull No. 274, 84 foot all welded steel tug.

Hull No. 275, 70 foot auxiliary yawl.

Hull No. 276, 86 foot all welded steel tug.

LEVINGSTON SHIPBUILDING CO.
Orange, Texas

NEW CONSTRUCTION:

One all welded petroleum barge 173′x39′x8′ 6″, for Pan American Refining Corp., Texas City, Texas. **Delivered May, 1938.**

Two all welded petroleum barges 92′ x 27′ x 6′ for Cenac Towing Co., Houma, La. **Delivered May, 1938.**

One all welded houseboat hull 55′ x 22′6″ x 4′ for The Texas Co., Port Arthur, Texas. **Delivered May, 1938.**

MANITOWOC SHIP BUILDING CO.,
Manitowoc, Wis.

NEW CONSTRUCTION: **One tanker** for Socony-Vacuum Oil Company, Inc., New York; 290′x49′ 6″x20′ 6″; 23,600 barrels capacity; 1500 H.P. twin screw diesel. Delivery date August, 1938.

THE MARYLAND DRYDOCK CO.
A Subsidiary of Koppers Company,
Baltimore, Maryland

NEW CONSTRUCTION: **One double ended steel diesel ferry boat,** Gov. Harry W. Nice, 208′ x 62′ x 9′, for the Claiborne-Annapolis Ferry Company; keel laid September 15, 1937; launched December 11, 1937; **delivered April 30, 1938.**

DRYDOCK AND ROUTINE REPAIRS: **Sidney M. Hauptman, Charles R. McCormick, Franklin K. Lane, E. J. Bullock.**

NEWPORT NEWS SHIPBUILDING & DRYDOCK CO.
90 Broad Street, New York

NEW CONSTRUCTION:

H360 aircraft carrier, CV6, Enterprise, for U.S. Navy.; keel laid July 16, 1934; launched October 3, 1936; **delivered May, 1938.**

H361, light cruiser, CL47, Boise, keel laid April 1, 1935; launched, December 3, 1936; delivery date July, 1938.

H362, light cruiser CL49, St. Louis; keel laid December 10, 1936; launching date April 15, 1938; delivery date April, 1939.

Hulls Nos. 363-364, two destroyers, Nos. 413, Mustin, and 414 Russell; keels laid December, 1937; delivery dates June and August, 1939.

Hull No. 369, twin screw mail, passenger and cargo liner for United States Lines Co.; length 723′, beam 92′, depth 45′.

Hulls Nos. 370, 371 and 372, three oil tankers for Standard Oil Company of New Jersey; gross tonnage about 11,500 tons; L.B.P. 525′; breadth molded 75′; depth molded 39′.

THE NEW YORK SHIPBUILDING CORPORATION
Camden, N. J.

NEW CONSTRUCTION:

Two light cruisers, Hull No. 413, Nashville (CL43), and **Hull No. 416 Phoenix (CL46)** of 10,000 tons each for the U.S. Navy Department; keels laid, 1935; **No. 413** launched October 2, 1937; **No. 416** launched March 12, 1938.

One destroyer tender for U. S. Navy; order placed December 27, 1937.

One seaplane tender for U. S. Navy; order placed December 27, 1937.

PHILADELPHIA NAVY YARD
Philadelphia, Pa.

NEW CONSTRUCTION:

Order placed for **DD404,** 1500 ton destroyer; no dates set.

PORTSMOUTH N. H., NAVY YARD
Portsmouth, N. H.

NEW CONSTRUCTION:

SS186 Stingray, submarine; keel laid
October 1, 1936; L.B.P. 300′, beam 26
loaded draft 15′7″; launched Octobe
6, 1937; commissioned March 15, 193
date of completion June 1, 1938.

Also building here, four more su
marines, Sculpin, Squalus, Searaven an
Seawolf.

THE PUSEY & JONES CORP.
Wilmington, Del.

NEW CONSTRUCTION:

One single screw, steel freight stea
er for the Philadelphia and Norfol
Steamship Co., Philadelphia, Pa. L.
A. 292′, L.B.P. 280′, beam 48′6″, dept
32′ 3″, draft 18′; geared turbine driv
4000 S. H. P.; 2 water tube boiler
Launched April 14, 1938; **delivere**
May, 1938.

Hull No. 1070, one steel hopp
dredge, Chester Harding; 2,500 cub
yard capacity; length overall 308′2
length B.P. 300′0″, breadth molded 5
0″, depth molded 29′0″. Contract dat
February 14, 1938; keel laid May 1
1938; delivery in 12 months.

SUN SHIPBUILDING AND DRY DOC COMPANY
Chester, Pa.

NEW CONSTRUCTION:

Hull No. 168, One diesel tanker fo
stock account, equipped with Su
Doxford engine; 542′5″ x 70′ x 40′
18,360 D.W.T. Keel laid August 1
1937; **launched May 20, 1938; deliver**
date June 15, 1938.

Hull No. 169, one oil tanker (steam)
520′ x 70′ x 40′; for Atlantic Refinin
Co.; 18,500 tons; keel laying date No
vember 30, 1937; launching date Jul
23, 1938; delivery date, August 6, 1938

Hull No. 170, one single screw stea
tanker for Bernuth, Lembcke Co., Inc.
New York; length 462′4″; **beam molde**
65′ 0″; **depth molded 35′ 0″, DWT ap**
proximately 12,900 tons. Keel laid Sep
tember 15, 1937; launching date Apr
30, 1938; **delivered May 12, 1938.**

Hull No. 171, one single screw stea
tanker for Tide Water Associated O
Co.; 462′ 4″ x 65′ x 35′; 12,900 dwt.
keel laid November 9, 1937; **launche**
June 9, 1938; delivery date June 18
1938.

Hulls Nos. 172, 173 and 174, thre
tankers for Standard Oil Co. of Ne
Jersey; steam turbine; 525′ x 75′ x 39′
16,300 dwt. Keel laying date, No. 172
April 18, 1938; delivery dates April
1939, November, 1939 and April, 1940
respectively.

UNITED SHIPYARDS, Inc.
Staten Island, N.Y.

NEW CONSTRUCTION:

Hull No. 856, fireboat for City o
New York. Length O.A. 134′ 0″, breadt
32′0″, depth 13′3″. Keel laid April 1
1938; estimated launching date July 1
1938; estimated delivery date Augus
25, 1938.

(Continued from Page 48)

the opportunity was proven out he benefit of our national in- n.”

Mers summed up his reasons why hould have an American mer- marine as follows:

“) Vessels submitted to our con- ould insure continuity of move- both export and import.

“) Vessels controlled by us protect us against exorbitant te

“) These controlled vessels give improved service to ex- rt and imports.

“ Domestic flag competition pre- nt discrimination against our by foreign vessels.

“ ese reasons are,” said the er, “all sound and valid, but reatest of all, and that is the eason, is the part an American ant Marine would play as an ary to the Navy. The sense of endence, the lack of knowledge, ther nations would have of our ion if we were forced to hire, ansportation of our troops . . . lue of these cannot be estimat-

“ 1914 there were 19 American nes operating to foreign coun- nd American overseas posses-

“I 1930 there were 83.

“B in 1936, due to consolidation andonment, it fell to 58. But rvice was far out in front the War.

A the present time we have some sels in foreign trade, 800 (in- tankers) in the coastwise and 200 in tie-up.

t of these vessels will be ob- n the next four or five years. s necessary to start building ately. Some action has already ken by the Maritime Commis-

ign commerce in the United is confined to approximately e routes—11 from the Atlan- h North and South; 7 from f and 5 from the Pacific; also on to South America, Mediter- Africa, India, Far East, West Europe and United King-

have 6500 miles of sea coast o 65 principal ports thereon.”

Names and News

● WAYNE JOHNSON.

When the Lurline sailed from Los Angeles on April 30 one of her passengers was Wayne Johnson, former assistant superintendent of the Los Angeles Shipbuilding and Drydock Corporation, who has gone to Honolulu to become manager of the expanded shipyard and drydock facilities of the Inter Island Steam Navigation Company. The coveted post was won in competition with a score of the Coast's most experienced shipyard executives.

Johnson came to San Pedro in 1923, following mechanic's apprenticeship in the Colorado & Southern shops at Trinidad. After a short period in the Southwestern Shipyards he joined the machine firm of Parke & Kibele, transferring in 1930 to the Los Angeles yards as outside salesman. He was made assistant superintendent in 1936.

● ERNIE GIBSON & R. S. MYERS.

Off for the wilds of Wyoming in search of big game recently went Ernie Gibson, assistant purser on the Lurline, and R. Sutton Myers, purser on the Monterey. We haven't heard the results of the hunt yet, but hope that they bagged a number of animals before returning to their ships.

Myers is a son of Ralph Myers, president of the Shipowners Association of the Pacific Coast.

● ROBERT D. PICKETT.

Bringing with him a great deal of experience, Robert D. Pickett has joined the San Francisco staff of the Transmarine Navigation Corporation, agent for the transpacific service of the Salen Line. He was a purser on transpacific ships for many years, as well as on the Dollar Lines' round-the-world ships. He also made several trips on the United Fruit Company's ships, under charter in the transpacific service by the States Line, later being transferred to shore duty with the organization in the passenger department.

When the Panama-Pacific Line took over the agency for this branch of the company's activities, Pickett was put in charge of handling the passenger affairs of the States Line, later being transferred to the Los Angeles office of the Panama-Pacific Line, remaining there until discontinuance of the line's intercoastal service.

● WILLIAM R. CROWELL.

After an illness apparently caused by overwork, William Robert Crowell, owners' representative on the Pacific Coast for the Shepard Line, passed away in Palo Alto on May 16. He was only 45 years of age, and leaves a widow and three children.

A veteran of the World War, Mr. Crowell went into the steamship business after leaving the army. When the Shepard Line entered the intercoastal trade in 1930 he joined the staff of that company as a checker on the dock in New York. Showing great aptitude for organization and management, he was later sent to the Coast in the capacity of owners' representative.

● CLAY HUTCHISON.

It is with most sincere regret that we learn of the passing of Clay Hutchison in Los Angeles on May 17 as a result of contracting pneumonia two months before. Mr. Hutchison was the well-known general passenger manager for Grace Line in San Francisco, being transferred to Los Angeles when the line ended its intercoastal service. He was 54 years of age, and left a widow and two children.

Mr. Hutchison was a veteran in the passenger business, rail and water, beginning his career with Dollar Line, thence going with Pullman Company and later with the Southern Pacific. From the last named company he went with Grace Line, being southern manager for some years until transferred to the Pacific Northwest, and finally to San Francisco to take over the post of general passenger manager after the resignation of Roy N. Crowder.

● L.A. YARD FILES ARTICLES OF INCORPORATION

The Los Angeles Shipbuilding and Dry dock Corporation has filed articles of incorporation with the Secretary of State's office at Sacramento, which authorize the issuance of $1,000,000 worth of common stock and $811,375 in preferred stock.

Pacific Paint & Varnish Co.

Synthex Red Lead Primer (Q. D.)
" Anti-Corrosive
" Anti-Fouling
" White Enamel-Non-Bilge (O.S. & I.S.)
" Cabin Enamels (Q. D.)
" Mast Colors, Hull Black
" Boottopping, etc.

Synthex Marine Spar Varnishes and Yacht White Enamel

Aluminum Enamel

Flat White (Inside & Outside)

A specialized finish for each paintable surface.

Pacific Marine Finishes have been used successfully for years by most of the important steamship companies. Each represents a specially developed product for a specific purpose. Quality—not price—is the objective of our Research Department.

L. M. DuCOMMUN
President

San Francisco and Berkeley

A. B. ROBERTSON
Vice President

SANDUSKY CENTRIFUGALLY CAST
BRONZE - BRASS - MONEL
TAIL SHAFT LINERS
PUMP LINERS - BUSHINGS
SANDUSKY FOUNDRY & MACHINE CO.
SANDUSKY, OHIO

TRADE LESLIE MARK

PRESSURE REDUCING VALVES
PUMP GOVERNORS
TEMPERATURE REGULATORS
SELF CLEANING STRAINERS

TRADE TYFON MARK
WHISTLES
SIGNALS

LESLIE CO., FOUNDERS AND MANUFACTURERS
LYNDHURST, N. J.
John H. Marvin, 1016 First Ave. So., Seattle

CORDES BROS, 200 DAVIS ST. SAN FRANCISCO

STOP Slipping as well as leaks on boat decks . . . through installation of

Case Weather Deck Covering

AN UNDER LAYER AND A NON-SLIP WEARING SURFACE

L.S. CASE CO.

INSTALLATIONS SINCE 1926 WITH LARGE FLEET OWNERS

L. S. CASE COMPANY

Applicators and Distributors
SAN FRANCISCO

7th and Daggett Streets

Phone: HEmlock 7821

BABCOCK & WILCOX BOILERS

Extra Values to Ship Owners and Builders

In DESIGN
Marine Boilers for Marine Service

In TRIAL RUNS
Experience Frequently Saves Money

In CONTINUOUS SERVICE
Regular Visits of B & W Service Men

The BABCOCK & WILCOX COMPANY, New York

Pacific Coast Offices:
450 Mission Street - San Francisco
Portland

Seattle

Los Angeles

PACIFIC MARINE REVIEW

JULY

938

Five Ships for Panama Pacific Line's New Coast to Coast Service

Lovely . . . . .

you'd say of
GLASSWARE like this

In the lustre and sparkle of fine glassware can easily be recognized the care and quality that has gone into its manufacture. In this respect, it is like many other products used aboard ship in which quality is quickly apparent.

There is one ship requirement, however, in which quality—or lack of it—is concealed from a casual examination. That product is rope.

Between several brands of rope, there may be little to judge in appearance. Yet there may be a wide variation in their strength and wearing qualities.

That is the reason that most ship operators of the Pacific specify TUBBS SUPERCORE AND EXTRA SUPERIOR MANILA Marine lines. They know that behind these brand names is the reputation of 82 years of dependable rope making. . . a reputation that takes the guesswork out of rope buying.

TUBBS ROPE

TUBBS *Cordage Company*
200 BUSH STREET, SAN FRANCISCO

Pacific Marine Review, Vol. 35, No. 7. Published monthly at 500 Sansome Street, in San Francisco. Entered as second

PACIFIC MARINE REVIEW

JULY 1938
VOL. XXXV NO. 7

CONTENTS

Editorial Comment:
Shipbuilding to Increase Employment 17
Our Replacement Program 18
Propulsion Machinery for C-2 Standard Motorships 20
Your Problems Answered 24
By "The Chief."
Steady As You Go 27
For the Deck Officers.
Deck and Engineer Officers' Licenses—Change of Masters 29
Modern Trends in Powering Vessels 30
By John R. West.
New Steel Motor Ferry Governor Harry W. Nice 33
A Remarkable Diesel Maintenance Record 35
New Tanker Fittings 36
A New Air Cooled Diesel Engine 38
Literature of the Industry 40
Spunyarns and Catharpins 41
On the Ways 42
Latest News from American Shipyards.
Marine Insurance:
A Generation of American Yachting 45
Radio and Safety at Sea 45
Early Lighthouse Building 46
Building in American Yards 54

Our Frontispiece

This month we reproduce a photograph of the spirited painting by C. R. Patterson showing the famous American Clipper Flying Cloud under full sail at sea. This vessel, built by the great Donald McKay of Boston, holds the sailing ship record from New York to San Francisco round the Horn. On her maiden voyage, under Captain Josiah Perkins Cressy, she left New York June 2, 1851, and arrived San Francisco August 31, 89 days, 21 hours from up anchor, New York harbor, to down anchor, San Francisco Bay. On her fourth voyage, in 1854, she made the same run in 89 days, 8 hours. Distance logged on the latter run, 15,091 nautical miles; average speed, 7.04 knots. It is claimed that no steamer afloat at that time could have maintained that speed on a non-stop run of such length.

Flying Cloud was the only vessel that twice made this voyage in less than 90 days. She was 235 feet long, 40.8 feet beam, and 21.6 feet depth, with a measurement tonnage of 1782.

PUBLISHED AT 500 SANSOME STREET . . . . SAN FRANCISCO

Entered as second class matter June 20, 1913, at the post office, San Francisco, under the Act of March 3, 1879. Published on the 1st of each month. Advertising and editorial forms close on the 15th. Subscription price, one year: Domestic, $1.50; foreign, $2.50; two years: Domestic, $[illegible].50; foreign, $4.00; three years: Domestic, $3.00; foreign, $5.50; single copies, 25c. Chas. F. A. Mann, Northwest Representative, 1110 Puget Sound Bank Bldg., Tacoma, Washington. New York Office, Suite 404-405-406, Two Hundred Broadway, Telephone COrdlandt 7-3579.

In New York City copies of Pacific Marine Review can be purchased at the news stands of I. Goldberg, 42 Broadway; Jacob Fuchs, 17 Battery Place; Philip Mandara, Greenwich Street and Battery Place. In Washington, D.C., at the news stand of the Carlton Hotel, 16th and K Streets.

J. S. Hines
President and Publisher

B. N. DeRochie
Assistant Publisher

Alexander J. Dickie
Editor

Paul Faulkner
Advertising Manager

F. Dryden Moore
Assistant Editor

PACIFIC MARINE REVIEW

OLUME XXXV JULY 1938 NUMBER 7

Shipbuilding and Employment

At the present time commercial shipbuilding in the United States is on a higher production level than at any time during its history, with the exception of the years of the Great War effort.

Conversely, at the present time we are faced with a tremendous unemployment problem.

It is a well-known fact that shipbuilding as an industry employs a larger number of men in proportion to the cost of the product than does any other modern industry.

The Maritime Commission, charged with speeding up shipbuilding, has, after investigation, declared that the minimum needs of the Navy in commercial vessels for emergency troop and cargo service require 50 vessels a year for the next ten years, and that this will be the minimum program for the Commission on subsidized construction.

To date, after a year and a half of effort, the Commission has 33 vessels under construction. On a 50 vessel per year basis the Commission should now have at least 75 ships under construction.

The Commission has also announced that the commercial replacement needs for a modern overseas American merchant marine are approximately 260 vessels a year for the next five years, or 1300 vessels in five years, at an estimated total cost of $2,500,000,000, or $500,000,000 a year. This, says the Commission, is too large a program for America to undertake.

Such a conclusion, it seems to us, is unwarranted for a Government that is spending several billions a year in direct relief and in made work projects.

It would be, we think, a safe prediction that if the Maritime Commission would build 260 ships a year at a cost of $500,000,000, and of suitable types, speeds, and sizes, they could sell such ships to American citizens for at least $200,000,000.

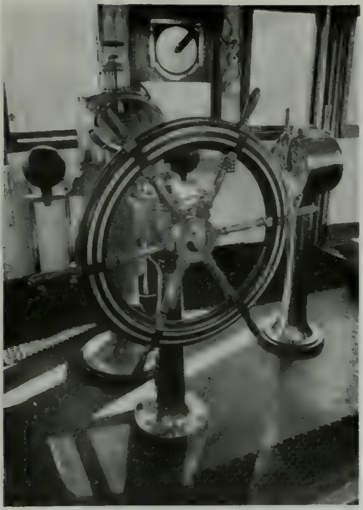
Now the proportion of ship cost that goes directly and indirectly to labor is approximately 85 per cent. The 500 million dollar shipbuilding program then would pay to American labor approximately 425 millions in wages and salaries, at a net cost to the American taxpayer of 300 million dollars.

It is fair to assume that if such a program of shipbuilding is not forthcoming, much of the labor that would benefit thereby would be on direct relief on other forms of work project, which could not show as large a salvage value as the products of shipbuilding.

The benefits of such a ship construction effort would be felt by business in every corner of this nation and would certainly go a long way toward solving our unemployment problems.

Congress should cut some of the red tape that shackles the Maritime Commission and turn that body loose to build more and better ships.

“Let's Star
Ou



Some Comment on the Progress of Replacement

The recent statements of Admiral Emory S. Land, chairman of the United States Maritime Commission, indicate a full realization of the replacement needs in the American Merchant Marine. On May 3, talking before the Chamber of Commerce of the United States, he declares:

“Our total seagoing fleet consists of 1422 vessels of 2000 tons and over, aggregating 8,470,000 tons. Of this fleet, a total of 1305 ships of 7,402,000 tons will be obsolete by 1942. To replace all the ships now nearing obsolescence would require the construction of 261 vessels of about 1,500,000 tons per year for the next five years. Such a program would cost in the neighborhood of $2 500,000,000 at current price standards for labor and material.

“Badly as the merchant marine needs new ships, there is no thought of such a prodigious undertaking. We plan a more conservative approach.

“From the standpoint of national defense, which is the Government's primary interest in creating a strong merchant marine, our minimum needs, according to the Navy's experts, require 500 ships within the next ten years. These vessels, it has been estimated, will cost $1,250,000,000. Although still pretentious, this represents a more rational program, and one that should be within our capabilities.”

Frankly we cannot quite see that the expenditure of 500 million dollars a year on merchant shipbuilding should seem such a “prodigious undertaking” for the present administration. Certainly it would be a much more profitable undertaking from every angle than is the spending of much greater sums per annum on W.P.A. and C.C.C. work. There would seem to be here an opportunity to greatly stimulate really useful employment and at the same time bring our merchant marine reasonably up to date.

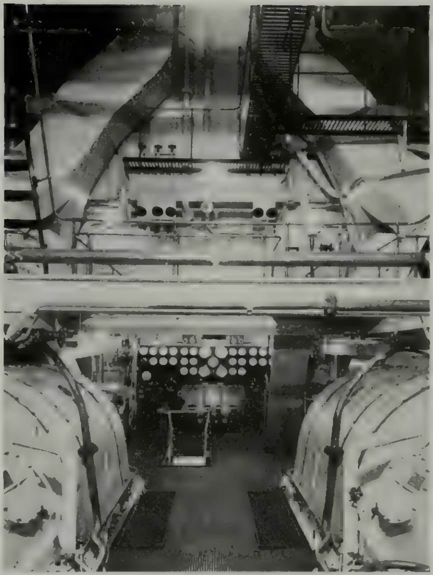
Why should the U. S. Maritime Commission be so shortsighted as to plan simply for the minimum requirements of the Navy during the next ten years? The Merchant Marine Act of 1936, which creates the Maritime Commission, does not limit the Commission to such planning. The declaration of policy which forms a part of that act reads:

“It is necessary for the national defense and development of its foreign and domestic commerce that the United States shall have a merchant marine (a) sufficient to car its domestic water-borne commer and a substantial portion of the water-borne export and import foreig commerce of the United States and t provide shipping service on all route essential for maintaining the flo of such domestic and foreign wate borne commerce at all times; (b) c pable of serving as a naval and mil tary auxiliary in time of war or n tional emergency; (c) owned an operated under the United Stat flag by citizens of the United Stat insofar as may be practicable; an (d) composed of the best-equippe safest, and most suitable types vessels, constructed in the Unite States and manned with a traine and efficient citizen personnel. It hereby declared to be the policy the United States to foster the deve opment and encourage the mainte ance of such a merchant marine.”

It is evident that if the minimu requirements for Navy needs are 5 ships within ten years, and the max mum overseas merchant marine r placement requirement is over 10 vessels within the next five years, w are not going to have the mercha marine contemplated by the Act building 50 vessels a year.

The merchant fleets with which w are in competition, those of Japa and the maritime nations of Europ were so far ahead of us in the spee and up-to-dateness of their fleets 1936 that they scared us into passi a new subsidy law to rebuild o merchant marine and keep it opera ing. Our Maritime Commission pr poses to do this with a program of ships a year. European and Japane shipbuilding programs last year ad ed to the fleets of our competito

Rebuilding Merchant Marine in 1938”



600 vessels, many of which are er and more economical than the els planned for our future pro- n.

ır program for replacements in oreign trade fleets of the United es should contemplate not less 200 vessels a year for the next years. Great Britain alone is ing them out at the rate of 280 ar.

ıch a program would go a long toward solving the industrial nployment problem. It would the United States 1000 modern, seagoing vessels with which to her place in world trade. It ld open or reopen all essential ign trade routes with a service would reflect credit on the Uni- States and bring back prestige to American flag on the seven seas.

date considerable progress has made in this direction, but that ress, as Admiral Land himself ares, “‘must be accelerated.”

ctual contracts let by the Maritime Commission during the past year

transatlantic liner of an improv- Manhattan type for the United es Lines	$15,750,000
16½ knot tankers	$37,556,000
15½ knot cargo carriers, C-2 gn	$31,852,652
16½ knot cargo vessels for Ex- Line	$10,120,000
tal, 33 vessels; cost	$95,278,652

astwise Shipping.

ırning from our foreign trading chant marine to the fleets carry- our domestic water borne com- e, we find an even greater need replacement tonnage and very being done about it. There is le room in these domestic trades the types of vessel required by Navy and Army in times of emer- y. Would it not be a wise move rovide for replacements in coastwise fleets by building vessels suitable for use as Navy and Army supply ships in an emergency, and then chartering these vessels on a commercial basis to coastwise ship operators? Certainly coastwise operated fleets would be more wholly available in war time than foreign trading vessels.

The vessels composing our coastwise and intercoastal fleets are more numerous and of greater total tonnage than those composing the foreign trading fleet. Speaking of this fleet, Admiral Land avers:

“As an adjunct of the national defense, it would be equally valuable in time of emergency, and from a strictly commercial standpoint, the domestic fleet, Great Lakes, Coastwise, and Intercoastal carries nearly four-fifths of our total water-borne traffic.

“Any program to develop and maintain an adequate and balanced merchant marine must provide for the rehabilitation of the domestic fleet. Under its general responsibility as the agency designated to accomplish this broad objective, the Maritime Commission is fully cognizant of the imperative needs of the domestic fleet, but unfortunately, under the law, it is not in a position to do much about it.

“The domestic fleet, by reason of the fact that it operates in a protected trade free of foreign competition, is not eligible for either the construction subsidies or the operating subsidies authorized by the Merchant Marine Act. The only method by which the Commission can assist in its rehabilitation under the law is by providing long-term construction credits at a low rate of interest.

“Present conditions in the industry make the value of this method exceedingly dubious. Many of the domestic steamship operators are in financial straits, the same as the operators in the foreign trade. With the foreign trade operators finding it a back-breaking task to make necessary replacements even with generous Government building subsidies, the domestic operators, lacking this advantage, cannot be expected to do much new building. The conclusion seems inescapable that if the rehabilitation of the domestic fleet is to keep pace with that of the foreign trade fleet some way must be found for facilitating it.”

We would respectfully suggest that the domestic fleet be rehabilitated to take care of the Navy minimum requirements. The Maritime Commission should be empowered to build commercial vessels ideal for coastwise and intercoastal trade and suitable to meet the Navy require-

(Page 52, Please)

Propulsion Machinery for C-2 Standard Motorships

Nordberg Manufacturing Company Building Eight 3000 S.H.P. Diesel Engines for Four Standard Cargo Carriers

On each of the first four diesel powered cargo vessels of C-2 design ordered by the U.S. Maritime Commission, the propulsion machinery will consist of two Nordberg 2 cycle, single acting, mechanical injection, direct reversible, vertical diesel engines with attached scavenging blowers and motor driven auxiliaries, such as lubricating oil pumps, cooling water pumps, and fuel oil transfer pumps.

The pair of engines will be connected through a hydraulic coupling to a common reduction gear unit for driving the single screw. The normal horsepower delivered to propeller shaft will be 6,000 at propeller speed of 92 r.p.m. and engine speed of 225 r.p.m. The engines are conservatively rated to provide 10 per cent overload continuously, amounting to 6600 shaft horsepower at a propeller speed of 95.1 r.p.m. and an engine speed of 232.5 r.p.m. They are also designed to deliver 25 per cent overload for two hours, which is 7500 shaft horsepower at a propeller speed of 99.2 r.p.m. and an engine speed of 242.5 r.p.m.

Each engine will have 9-cylinders of 21-inch bore, 29-inch stroke, single-acting, direct-reversible, and constructed with crossheads. They will be arranged for controlling and reversing simultaneously or individually from a central control stand conveniently located between the two engines. These engines are port scavenging, fully enclosed and fitted with force feed lubrication to all main moving parts. Automatic scavenging valves control the flow of air through the inlet ports, thus assuring a clean, uncontaminated air supply resulting in maximum efficiency of the scavenging process. Scavenging air is supplied by rotary positive displacement type blowers, gear driven from the crankshaft and mounted on each engine at the aft end. The reversing mechanism is of the latest Burmeister and Wain type.

● Water Cooling System

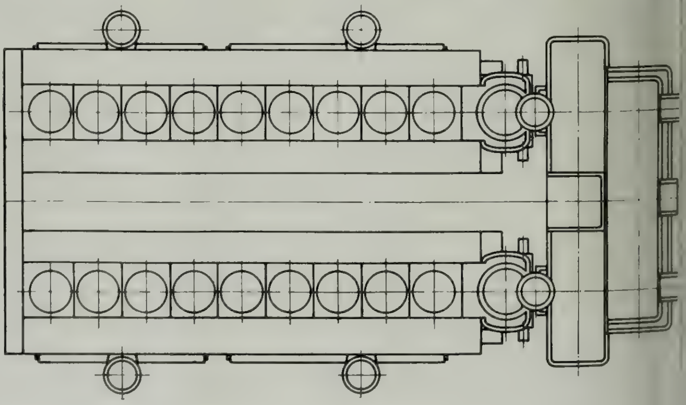
A separate fresh water cooling system is provided for engine cooling, consisting of fresh water tanks, three motor driven fresh water circulating pumps and three heat exchangers. Two circulating pumps and two heat exchangers will be required for regular operation; the third set is for stand-by. All pumps and heat exchangers will be so interconnected that any one pump may be operated with any one heat exchanger.

The fresh water pumps draw the water from the fresh water tanks, force it through the heat exchangers, where it is cooled and thence circulated through the engine cylinders and heads and discharged back into the fresh water tanks for recirculation.

Three salt water circulatin pumps are provided for circulatio of salt water through the lubrica ing oil coolers and heat exchanger

● Bedplate and Framing

The engine bedplate is made cast iron in two sections and co tains the main bearing seats, whic are fitted with two-part removab steel shells lined with centrifugal cast babbitt. The main frame co sists of a series of cast iron "A frames mounted on the bedplate form a rigid support for the ca iron cylinder blocks. The spaces b tween "A" frames are enclosed wit large aluminum covers provide with hingled quick inspection port The cast iron cylinder block frames and bedplate are assemble with tie rods or through bolts whic are designed to relieve these ca iron members of tensional stresse These tie rods extend from the be plate below each side of the ma bearings to the top of the cylind blocks and are tightened by mea of a special hydraulic jack to pr duce the same stress in each rod.



Cylinders

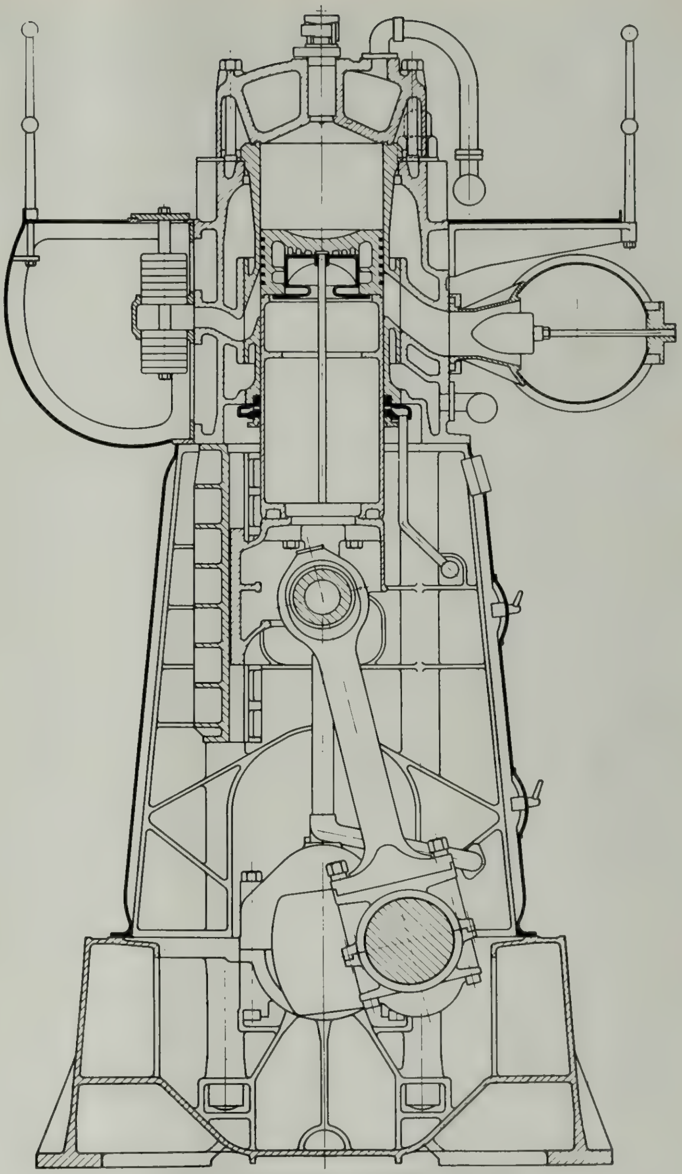
Each cylinder is provided with a rmovable cylinder liner having svenging ports on one side and exhist ports on the opposite side wich are uncovered by the piston athe bottom of the stroke. The allc cast iron cylinder heads are of siple and symmetrical design havii a central opening where the fuel vve is mounted and provided with onings for air starting, relief and iicator valves. The heads are waterjketed and provided with covers f cleaning and inspecting the jket spaces. Fuel injection valves a of the differential pressure operad type located in cages and fitted wh easily removable water-cooled nzles. A small renewable filter of ntal edge type is incorporated in eh fuel valve. Starting valves of t air operated pilot piston type a located in cages in each cylinder hd. Cylinder relief valves are also lated in cages.

Pistons

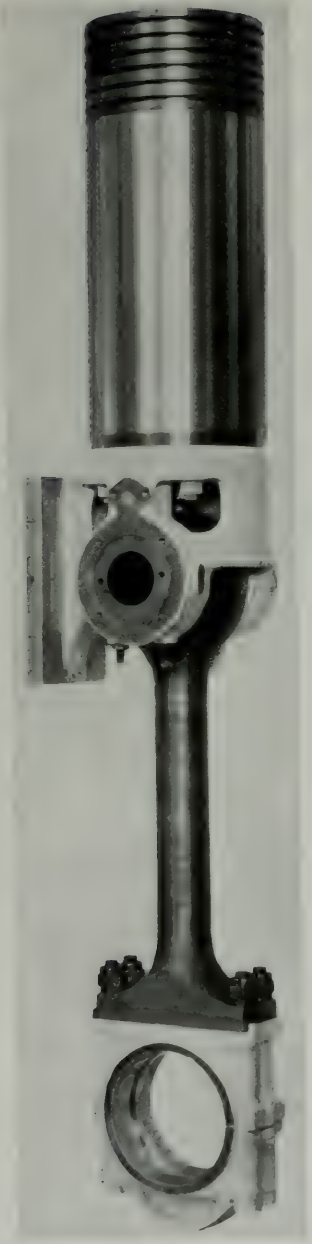
The pistons are of two-piece consuction made of special alloy cast in and are bolted directly to the cssheads. The piston head carries t packing rings and contains the c cooling arrangement through wich lubricating oil is circulated a high velocity. The cooling oil is bought up through hollow drilled cnnecting rods, then out to one se through the hollow crosshead p and by copper tubing to the pist head. Cooling oil leaves the pist through another tube down to t opposite side of the crosshead p and out through a free running tlescopic pipe back to the engine snp. The piston head is attached tthe trunk or skirt which, in turn, i attached to the crosshead, and tnsmits the piston load through tthe crosshead, thereby eliminating pton rods. The bottom end of each min cylinder liner is fitted with wer rings and lantern gland of scial design which wipe the pist to return crank case oil to the nk case and collect contaminated from the cylinder walls. These itern glands are piped to drain taminated oil outside the engine.

Crosshead Construction

These engines are equipped with crossheads and gib type guides to take the horizontal thrust from the connecting rods and guide the pistons in the cylinder bores. The pistons are, therefore, entirely clear of the cylinder walls and liner wear reduced as piston rings alone bear against the walls. The crosshead bodies are made of cast steel with babbitted slipper type shoes, and crosshead guides are made of cast iron rectangular in shape and are bolted rigidly between the "A" frames along the inboard side of each engine. Crosshead pins are open hearth steel forgings, hardened and ground. Adjustment for crosshead shoe wear is provided for by shims between the gibs and guides.



Transverse section through cylinder and frame.



Piston, crosshead and connecting rod.

● Crankshaft

The crankshaft is a solid forging made of special open hearth steel. The shaft is drilled through the crank webs, pins, and journals, to provide through passages for lubricating oil from the force-feed system. Connecting rods are also open hearth steel forgings with upper ends fitted with removable steel backed bushings lined with centrifugally cast babbitt; the bottom ends are fitted with cast steel Marine type crank pin boxes equipped with removable steel shells lined with centrifugally cast babbitt.

● Controls

Hand levers for engine control and reversing are mounted on each engine and interconnected with like levers at the central control stand. Reversing and starting are accomplished in the following manner:

The reversing lever shifts the starting air cam shaft mechanically to place either "ahead" or "astern" starting distributor cams in operation;

Then the control lever is moved to "start" position, which opens a valve supplying air to starting distributor and air operated valves on power cylinders;

Air is also supplied to a brake cylinder to prevent cam shaft movement for approximately 120 degrees after the engine begins turning over on air, thereby setting fuel cams in new position and turning scavenging blower reversing valve for reverse operation;

Interlocks prevent incorrect operation of control and reversing levers;

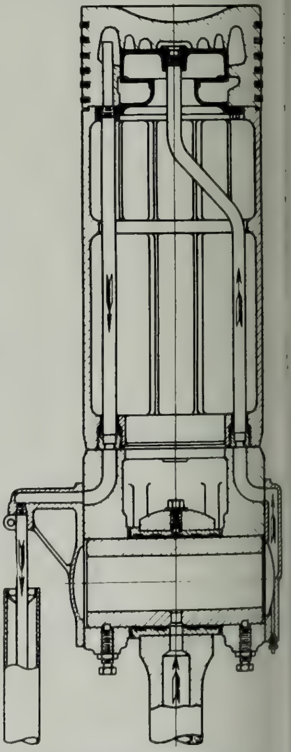
Continued movement of control lever from "start" to "fuel" shuts off starting air and places engine in operation on fuel;

Bringing the control lever back to "stop" position cuts out the fuel injection pumps; and

The hand control lever acts upon the speed regulating governor to control fuel pump cutoff for various engine speeds.

One central control station for the pair of engines is located conveniently in the engine room. Gage boards on which are mounted the required gages, tachometers, revolution counters, exhaust pyrometers, and direction of rotation indicators are placed conveniently at the central control stand.

Each engine is equipped with a regulating governor of the centrifugal type, gear driven from the crank shaft and capable of maintaining any desired speed from 50 p cent full power to full power wi not more than 5 per cent variati of the desired speed. An indepe dent overspeed pendulum govern of the Burmeister and Wain ty designed for automatic resetting, provided to cut off the fuel supp when the engine revolutions exce 15 per cent of the designed servi speed. The overspeed governor c be manually adjusted while the e gine is in operation to limit the e gine speed to approximately 5 p cent or 10 per cent over the actu operating speed down to 60 per ce of the operating speed. The acti of the overspeed governor with t ship cruising through heavy seas such that when the propeller load momentarily relieved, due to t vessel pitching, the fuel pumps a first limited to half load pumpi and if the speed is not corrected this action, a secondary trip cu the fuel pumps off to idling po tion. This action makes it possib for the ship to proceed at a go



Section through piston, showing cooling water system.

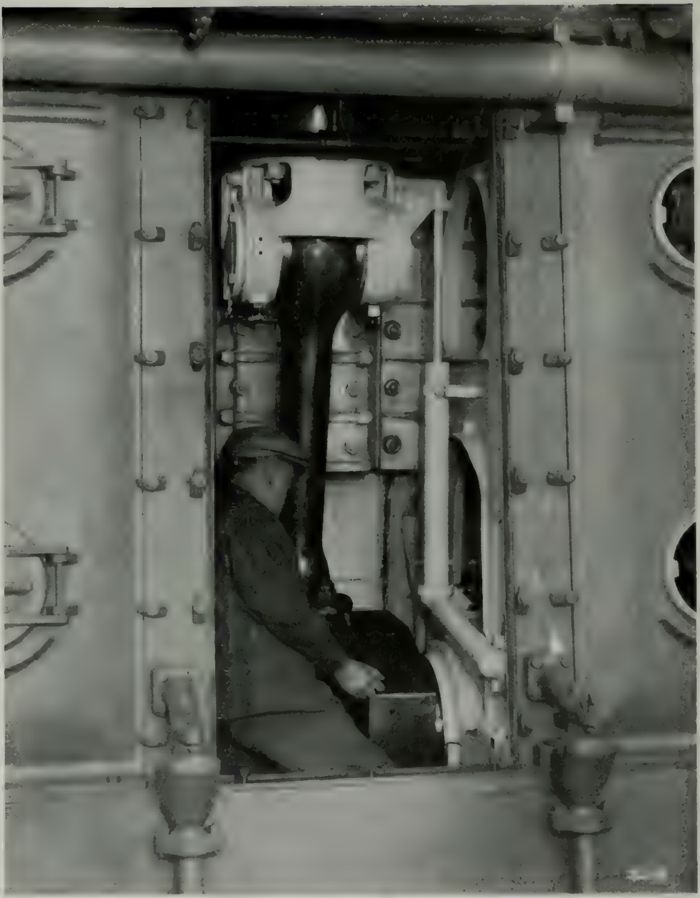
re of speed without any undesirae racing of engines when the ppeller load is suddenly relieved b pitching of the vessel.

Fuel Injection

Fuel oil is delivered to the injectn valves in each cylinder head by iividual high pressure injection pmps of the plunger type. The pmps are cam operated from the cn shaft which is gear driven from t crank shaft. Each pump can be iividually cut in or out of operatn and may be removed and repced while the engine is in operan. A plunger type fuel oil transf pump is attached to the engine f transferring fuel oil from serve tanks to injection pumps.

Lubrication

The force feed lubricating oil stem is supplied with oil by motor dven pumps which take their suctn from sump tanks built integral th the hull and located between egine supporting girders under the fdplates. These sump tanks will ao receive oil coming from the hydaulic couplings. A portion of the lbricating oil is discharged through dplex strainers, thence through tullar oil coolers to each engine, wile the remainder is discharged io an overhead tank for gravity fd to each hydraulic coupling. Ech engine lubricating system is cmplete in itself although the two stems are interconnected and valve so that oil from either system my be used in either or both enges in an emergency. A third motor driven lubricating oil pump and a tubular cooler are provided for stand-by service.

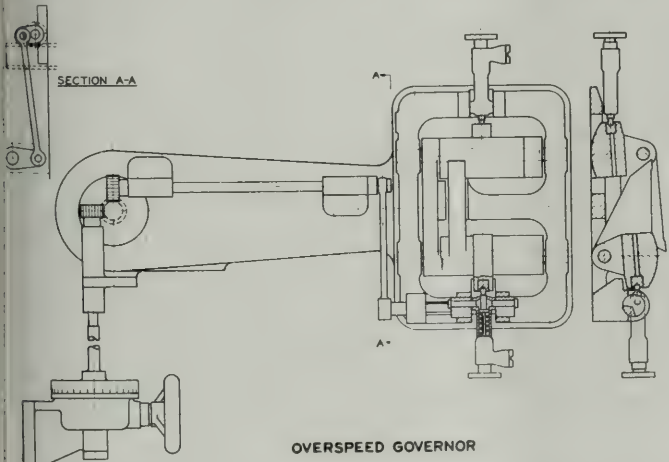


One crank case cover removed, showing accessibility of piston, crosshead, guides, crank pin and main bearings.

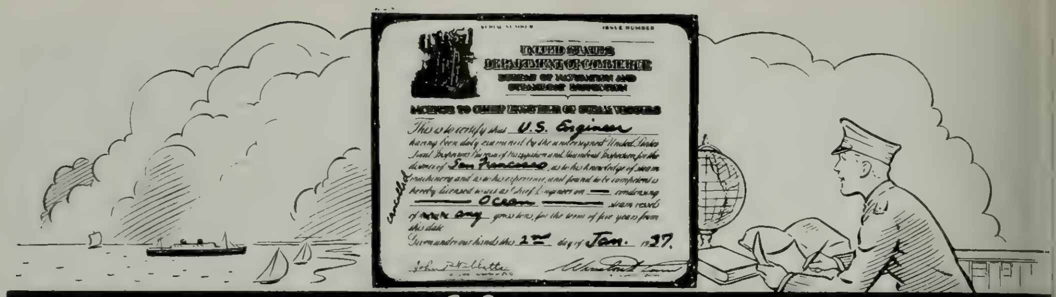
The working parts of the engine are lubricated from this force feed system, but the major portion of the oil circulated is used to cool the piston heads by circulating through them at high velocity. The oil leaving the pistons is returned to the sump after passing through individual chambers where the flow may be inspected, and the temperature is measured by indicating thermometers. The power cylinders are lubricated by unit type mechanical force feed lubricators.

Each engine is equipped with a motor driven turning gear consist-

(Page 52, please)



OVERSPEED GOVERNOR



SERIAL NUMBER ISSUE NUMBER

UNITED STATES
DEPARTMENT OF COMMERCE
BUREAU OF NAVIGATION AND
STEAMBOAT INSPECTION

LICENSE TO CHIEF ENGINEER OF STEAM VESSELS

This is to certify that U.S. Engineer having been duly examined by the undersigned United States Local Inspectors Bureau of Navigation and Steamboat Inspection for the district of San Francisco, as to his knowledge of steam machinery and as to his experience, and found to be competent is hereby licensed to act as Chief Engineer on — condensing — Ocean — steam vessels of any gross tons, for the term of five years from this date.

Given under our hands this 2nd day of Jan. 1937.

Cancelled

Your Problems Answered

by "The Chief"

The word "Cancelled" was inscribed on face of the above license at the direction of the Bureau of Marine Inspection and Navigation. As used here it means "Specimen Copy."

QUESTION

Considering that alternating current main generators and motors constitute the straight electric drive, what are some of the special and combination drives?

ANSWER

In the last analysis, every ship is special and custom made for a particular owner or a certain trade route or use. However, they may be grouped together into general classifications about as follows:

(1) The straight A.C. electric drive for high power variable speed maneuverability of naval vessels; typically the U. S. S. California or U. S. S. Saratoga.

(2) The simplified A. C. drive for the larger passenger or combination passenger and freight liners in the merchant marine. Representative of this class, the I. M. M. Line S. S. Virginia, Pennsylvania and California. (Many refer to this class of ship as T. E. S. for turbine electric ship instead of S.S. for steamship.)

(3) Tankers or other special purpose boats, where the propulsion capacity of boilers and engines is needed in handling cargo. Tankers now use main generators to supply cargo pumps. This may be true of ore handling vessels and others. Here electric drive is indicated because of the ease with which the main power may be distributed to the cargo machinery. They may be either diesel or turbine electric ships. Usually they will be D. C. drive but may well be A. C., as equipment for A. C. is available for every application.

(4) Ferryboats of the double ended type, either steam or diesel, find electric drive very valuable economy. They may run the forward screw at a speed where it neither pulls nor drags, thus saving much and putting all the load on the after propeller, where it belongs. This application is usually small enough to warrant D. C. use, and generators would be gear connected to the turbine, thus using high speed turbine with generator speed at optimum value. There are many examples of this drive in both Pacific and Atlantic ports.

(5) Fireboats are a good example of the value of electric drive for control and maneuverability, and also to drive large and powerful pumps as well as main propulsion.

(6) Tugboats illustrate admirably the extreme flexibility of electric drive, as, if they are running light or with small tow, they can speed up the propeller to full power without overspeeding the prime mover. Or, with a very heavy tow, they may run the prime mover at full speed, hence full power, yet at the same time feed that full power into the greatly reduced speed of the propeller. This means maximum ship speed at all times.

(7) The same discussion as (6) above applies to some extent to Coast Guard cutters, ice breakers or Great Lakes train ferries, which break ice in the winter and also salvage boats. Here the ability to tu the propeller along steadily, reduc ed speed but under full contro throwing sometimes full or overloa power into the screw, sometimes n power, is needed to hold spee steady. Also the light weight of th revolving pails makes for minimu damage when propeller blades strik ice.

(8) Dredges of the seagoing type frequently use the main generator of electric drive combinations t drive the large pumps and othe auxiliaries associated with this specialized work.

Yachts may adopt electric driv either steam or diesel, because o its smoothness, noiseless operatio and particularly because of its op eration from the pilot house whe desired. This remote control of elec tric drive is entirely feasible in an size.

QUESTION

If the electric system of propu sion constitutes a speed reducin element and clutch between th prime mover and propeller, why d we find some generators geared t the prime movers, and in some case find the screw driven by a moto geared to it through a speed reduc ing gear?

ANSWER

The generator may be geared t the prime mover if it is a D. C. gen erator and the prime mover is a tur bine. This is because it is difficul if not impossible, to build the D. C generator in speeds of 2400 r.p.m. o

er in sizes larger than 10 or 20
W. The limiting factor here is
e commutator, which must be
ade either longer or larger in dia-
eter as the K. W. capacity in-
eases. The length is limited by
ndamental limitations of the cop-
r and insulation. The diameter is
nited by the speed. As the speed
creases we must reduce the dia-
eter of the commutator to limit the
locity of the surface passing un-
r the brushes to less than 9000
et per minute. Thus a speed re-
cing gear is almost invariably
ed for large D. C. generators, tur-
ne driven.

To gear connect the motor to the
opeller is not so usual. Opinions
ll differ as to its merits, and it
ually ends upon a decision based
costs, weights and space. It is
ssible to build D. C. motors at pro-
ller speed in any size wanted. As
th all classes of machines the ca-
city will increase with the speed,
aving weight and size the same.
hat is, for a given capacity an in-
ease in speed gives a commensur-
e decrease in weight and size.
hus, with a slow speed propeller
r some special use, such as trawler
tug, the reduction in weight of
e motor may far exceed the in-
ease of weight due to the neces-
y of a speed reducing gear. An
provement in efficiency may be
ident with the high speed motor, but this would be largely offset by the losses in the gear.

Seldom, if ever, do we find the A. C. generator geared to the prime mover. A. C. generators can be built for any necessary speed up to 3600 r.p.m., which usually is adequate for the main engine.

QUESTION

What are the relative weights and losses of geared drive and electric drive?

ANSWER

This question must be very carefully treated and considerable understanding must be allowed in the answer. Manufacturers and designers, even though they make both geared and electric drives, are reluctant to issue these figures for publication.

And wisely so, because figures of this nature will invariably be misused. These figures will change with every ship design, with different designers, different capacities, and different operating engineers. They may vary with successive trips of the same vessel. Hence engineers are inclined to want to be very specific in making comparisons.

The fact remains that there is a field for both. Neither may be considered as outmoding the other.

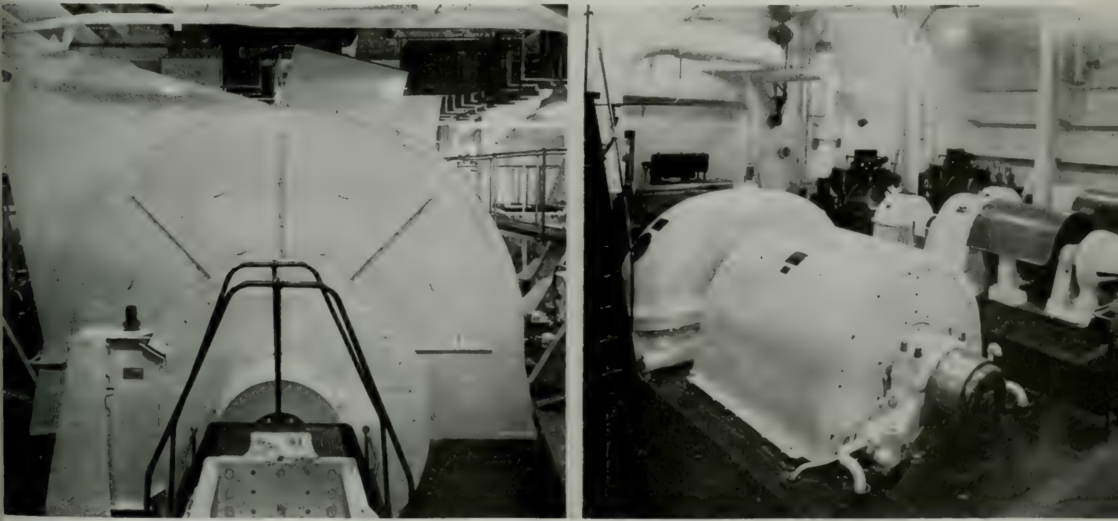
The following tabulation is prepared and offered solely by "The Chief." The figures may be controversial, and all are invited to correspond and express their differences of opinion.

This table is an attempt to express the input to output ratio or efficiency of the several sections of the plant through which the energy in the fuel must pass before it is transformed into useful energy on the shaft. This enables us to make a comparison point by point of the two systems.

It is based upon a purely hypothetical vessel in which the best thought has been to get the best job. Not necessarily the most efficient job, but best from a cost and weight and practicality standpoint.

All of the units could be improved in efficiency by increasing weight and cost. The entire plant is a compromise between cost and other factors.

	Efficiency %		
Item	Reciprocating Engine	Double Reduction Gears Turbine	Electric Drive Turbine
1. Boilers	80	80	80
2. Cycle	40	50	50
3. Prime mover	60	70	75
4. Generator plus cable			96
5. Motors			94
6. Gears		95	
7. Auxiliaries	90	85	80
8. Ventilation factor			95
9. Overall efficiency	17.3	22.6	21.6
10. Lbs. fuel oil per S.H.P. hr.	.78	.61	.63



in propulsion motor (left) and generator on tanker J. W. Van Dyke. 5000 H.P., 2300 volts, motor speed 90 r.p.m. Generator speed 3600 r.p.m. 60 cycle, 3 phase, A.C.

Item 1. It is assumed that we have the same boiler plant in all three cases. We will, however, use high superheat in both turbine drives.

Item 2. The cycle efficiency is a function of the pressure, superheat and condensing temperature. The cycle efficiency is better in the turbine plant because of the superheat and higher vacuum which they can utilize.

Item 3. Prime mover efficiency is the measure with which the engine converts the energy available in the steam to useful energy on the shaft. The turbines again should be better than the reciprocating engine because of no condensation loss, practically no friction loss, or radiation loss. The electric drive turbine should be a little more efficient because it does not carry a reversing turbine on its shaft, and by utilizing more stages and other refinement this improvement is indicated. This is a debatable point.

Item 4. Generator efficiency includes losses in control and transmission of the power. It includes net excitation but not excitation losses, such as that incident to rheostats and D. C. generation.

Item 5. Motor efficiency, like generator efficiency, includes net excitation and ventilation losses.

Item 6. Gear losses include only the losses involved inside the gear case.

Item 7. This item shows a greater loss for electric drive and a minimum for the reciprocating engine. This is for the reason that electric drive has much more auxiliary power, probably electric galley, more and bigger lights, more ventilation and other auxiliaries. It also has the excitation auxiliaries. The gear job will have more lubricating oil auxiliaries and more circulating water power than the reciprocating engine. Hence it is indicated at more loss than the engine but less than the electric drive.

Item 8. Ventilation factor. This is an attempt to show the loss due to running ventilation blowers for the motors and generator if needed. In any case much air must be brought into an electric drive ship engine room, and power is required to move and direct it.

Item 9. The overall efficiency of any series of units, where each reduce the available by a stipulated amount, is obtained by multiplying the several efficiencies, each as a decimal, together giving a reduced decimal.

Comparison of these efficiencies shows the relative merits of the systems as far as input-output goes. It does not show the cost factor or weight factors.

Item 10. The efficiency factors shown are on a basis of energy or B. T. U. in the fuel per H. P. hour divided into the energy equivalent of 1 H. P. hour. The latter is 2545 B. T. U.s per H.P. hour. Assuming fuel at the standardized value of 18,600 B. T. U.s per pound, we have

$$\frac{2545}{18600 \text{ x efficiency}} = \text{lbs. of oil per}$$

H. P. hour. This figure in the tabulation would be for all purposes and is the figure of comparison usually used.

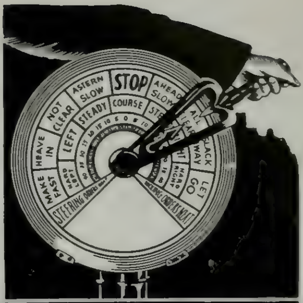
On this basis we find the geared job a little more efficient. Also it would be a little lighter than the electric drive, and cost less. The most interesting point to be learned is to measure the value of efficiency. Note that the difference in the losses in gears and generators is insignificant compared to the cycle loss. It is the cycle or steam conditions and prime mover efficiency which make the big difference.

Also note that whereas the geared job is only 1 per cent better than the electric job, yet it is 1 point out of 22 points, or 1/22 or 4½ per cent better as a comparison. It all goes to show how careful we must be in using figures.

Most famous and largest mercantile turbo-electric drive is on the French liner Normandie.

Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A DEPARTMENT FOR DECK OFFICERS

Hazards in Closed or Poorly Ventilated Spaces

Attention of all maritime personl is directed to the hazard incident the refrigeration of perishable rgo by means of blocks of so-called ry-ice" which is in reality nothing t solidified carbon dioxide. At a mperature of about -110 degrees F., rbon dioxide solidifies and takes e form of a white crystalline aterial.

Blocks of solid carbon dioxide will, placed in an atmosphere of ordiny temperature, evaporate into carn dioxide gas. In ordinary temperares, carbon dioxide remains a colless, odorless, and tasteless gas. If atmosphere of carbon dioxide is tered without proper protection, a rson will collapse after the first w breaths because of suffocation, ., lack of oxygen.

Inasmuch as the temperature of e solid carbon dioxide is approxiately -110 degrees F., the weight density of the gas into which the lid evaporates, is exceedingly high. ould a block of this material be aced on the floor of a room, the dission of the cold, colorless gas ong the floor would be very similar appearance, could it be seen, to the ater from a melting ice cake.

As the gas is gradually warmed, s volume increases and, while still uch heavier than air, it would form dense layer of gas over the whole oor of the room. If the gas is heated ore rapidly, its volume would become greater and its diffusion into the air above would be accelerated. After a period of many hours, the gas and air would form a complete mixture.

When therefore quantities of solid carbon dioxide in the form of so-called "dry ice" are dropped into and around cargo in a ship's hold, it gradually evaporates into cold, dense, carbon dioxide gas which immediately flows in the same manner as water to the bottom of the holds and forms a blanketlike layer there. Should sufficient "dry ice" be added, the entire hold would be filled with pure carbon dioxide, entirely displacing the air.

● Deaths on Empire State

The recent deaths aboard the motor vessel Empire State can be attributed directly to the fact that about one-half ton of solid carbon dioxide "dry ice" was distributed around a cargo of canned cherries in order to refrigerate them. These cherries were stowed in No. 2 hold. Four days after the vessel sailed she called at a port where another half ton of "dry ice" was added.

When the vessel arrived at New York, the cargo had been refrigerated with a ton of solid carbon dioxide for a period of 8 days. When the stevedores removed the hatch covers and entered the hold, they almost immediately collapsed upon the top of the cherry containers. It should be pointed out that there was about 12 feet between the top of the containers and the underside of the deck. Four men employed by the stevedoring company were asphyxiated.

Emergency squad No. 15 from the New York Police Department removed the second mate and a deck hand and the bodies of the four stevedores with the use of oxygen breathing apparatus. The second mate, a deck hand, and two other stevedores were resuscitated after extensive treatment at a hospital.

● Dry Ice Hazards

Analysis of the above incident points out several interesting facts which should be borne in mind by all persons having occasion to use quantities of "dry ice," either ashore or afloat. It is apparent that since the workmen experienced no difficulty in distributing this additional refrigerant around the cargo at the port of call where the second half ton of "dry ice" was added, the level of the carbon dioxide gas had not risen sufficiently high above the tops of the cherry containers to produce a noticeable lack of oxygen, nor had sufficient diffusion of the gas taken place to appreciably reduce the oxygen content of the atmosphere in the hold. At this time the gas was still exceedingly cold and dense, and surrounded the cherry containers much as ice water would if poured in around them.

Four days later, when the vessel arrived at New York, the additional half ton of solid carbon dioxide had evaporated and the temperature of the atmosphere had risen. These factors caused a more rapid diffusion and mixture between the gas and air, a decrease in density of the gas in the lower levels, and in total produced an atmosphere sufficiently deficient in oxygen to cause immediate collapse of any person entering it without oxygen breathing apparatus.

The case further illustrates the inadequacy and uselessness of gas masks in an atmosphere where sufficient oxygen is not present. Obviously a gas mask in itself does not produce oxygen. At least 16 percent of free oxygen must be present in any atmosphere which is to be entered with a gas mask on. It should be borne in mind that the normal oxygen content of the atmosphere is approximately 21 percent.

### ● Hose Masks and Oxygen Breathing Apparatus

Hose masks are desirable for use in compartments where the oxygen supply is depleted, or where poisonous gases are encountered. However, the wearer is limited in his movement as the trailing hose might become entangled in a projection. The hose must be of sufficient length to insure that the pump can be situated where it can supply fresh, clean air to the wearer of the mask. With the hose mask the wearer may work in the compartment for long periods of time. As long as the pump is worked in the open air, the wearer receives plenty of fresh air.

Oxygen breathing apparatus is more particularly suitable for use whenever the wearer is to move about considerably in the compartment. The self-contained oxygen breathing apparatus furnishes protection both against suffocation and the breathing of poisonous gases.

The gas mask offers protection only against poisonous gases and is useless in compartments where the oxygen supply is deficient. The gas mask is, however very useful in working for short periods of time in compartments containing poisonous gases in limited amounts, as the wearer has a greater freedom of movement.

In all cases where it is necessary to enter closed or poorly ventilated compartments in which there is any suspicion that the oxygen supply is deficient or that poisonous gases may be encountered, the most suitable breathing protection available should be worn by the person entering. In every such case he should wear a safety belt with a life line properly attached.

A suitable system of signals should be arranged between the wearer and the life line attendant, in order that prompt action may be taken in hauling him out should the necessity arise. The wearer should be instructed to signal at short intervals that he is all right. If the signal is not received at stated intervals by the attendant, he should immediately be pulled from the compartment.

In holding drills, or demonstrating the oxygen breathing apparatus, it is often noted that in fastening the shoulder straps, that they are passed over the shoulders and the ends snapped into the movable ring on the safety belt. To insure a good fit and prevent the straps from falling off the shoulders, they should be passed over the shoulders, crossed on the back, and snapped into the rings provided at sides of cardoxide tank. The safety belt should be fitted around the waist leaving the safety ring clear to which can be attached a safety line. In all cases the safety line should be secured about the shoulders so that the man may be pulled, head up, through a small opening.

All personnel using gas masks, oxygen breathing equipment, or fresh air masks, should pay particular attention to the instructions furnished with the equipment.

● Many Dangerous Cargoes.

There are, in fact, many classes of cargo, particularly cargoes of plant origin, which both absorb oxygen and give off toxic gases. Among these are linseed cake, rosin, tobacco, potatoes, oranges and similar products, which, aided by moisture, may cause a more or less dangerous increase in carbon dioxide content of the air and, under certain conditions, generate carbon monoxide. In one instance, four men lost their lives in a hold containing rice bran which had heated spontaneously, and in another, four men died in a hold containing hides and coffee beans, which had become wet as a result of grounding of the vessel.

The generation of gases from cargo may occur under circumstances which are quite unusual and unexpected, as in the case of a tank which had contained whale oil and which had not been cleaned out after discharge of the cargo. A crust had formed over the whale oil residues and when this was broken, in order to remove a valve, poisonous gases, resulting from fermentation of the residues, were released. Two of the workmen escaped, but three others were overcome and died. Investigation of conditions in a similar tank showed the presence of carbon monoxide, which was probably the cause of the fatalities.

—Bureau of Marine Inspection and Navigation Bulletin.

Early Marking of New York Harbor

There has recently come into the possession of the Lighthouse Service, by transfer from the United States Coast and Geodetic Survey, an original copperplate engraved just 100 years ago and showing the plan proposed after Congress had appropriated $200,000 for the building of a lighthouse on Flynn's Knoll in the approach to New York Harbor. The lighthouse on Flynn's Knoll was never built, because of engineering difficulties, but the matter was one of great importance in the early marking of New York Harbor.

The knoll which was such a danger to navigation, lay just to the north-west of Sandy Hook, and between the main channel and the swash channel, in those days the only entrances to New York Harbor. Particularly was it a menace to ships entering by the deeper main channel, for it necessitated a change of course of approximately 90°. The proposal for the erection of a lighthouse upon the knoll, which would have had to be built in about 15 feet of water, was one of the earliest instances in which serious consideration was

ven to the possibilities of building
aid to navigation on a submarine
te exposed to practically the full
eep of the sea.

The structure proposed was a
one tower, protected by an elabor-
e pile breakwater backed up with
orap, but after an examination of
e Flynn's Knoll site had been made
was finally decided that the engin-
ring difficulties were too great.
or about 40 years, the question of a
ht on Flynn's Knoll was at various
nes advocated and considered, but
ring this period the need for such
vigational aid became greatly dim-
ished through the erection of the
rious range lights which now mark
e channels of New York Harbor.
nce the opening of the Ambrose
annel, most of the deep-draught
affic has been diverted from the
d main channel and the swash
annel, and with the introduction
more and more lighted buoys to
ark the channel confines, Flynn's
noll has now ceased to be a serious
enace to shipping.

—Lighthouse Service Bulletin

Book Review

**Artificial Light and Its Applica-
ons**, 258 profusely illustrated 8½
11" pages, published by the West-
ghouse Lamp Division of the West-
ghouse Electric and Manufactur-
g Company. Price 75 cents.

This is a new revised and greatly
larged edition of the Westing-
use lighting handbook. Where the
rlier edition contained but 7 chap-
rs, the new contains 19, some of
hich are new, others of which are
aborations. Tables have been re-
sed and the text has been simpli-
ed and profusely illustrated.
mong some of the new chapters
e those on Photometry, Color,
heatre Lighting, and Sports and
ecreational Lighting.

Stressing the important part arti-
cial lighting plays in eyesight con-
rvation, space is devoted to the
ysiology of the eye and its reac-
on to light. The application of
hting in industry, commerce, and
e home is fully treated.

This book is indeed a record of
cts valuable to the experienced en-
neer for reference and to the be-
nner as a textbook.

Engineers' Licenses

The following list shows the licenses granted during the month of May to engineer officers of the merchant marine at Pacific Coast offices of the Bureau of Marine Inspection and Navigation.

Name and Grade	Class	Condition
SEATTLE		
Nathaniel L. Katcher, 3rd Asst. Eng.	OSS, any GT	O
Joseph F. Sokytis, Chief Eng.	OMS, any GT	O
HONOLULU		
James F. Murphy, Chief Eng.	OSS, any GT	RG
Edward H. Holstead, 1st Asst. Eng.	OSS, any GT	RG
SAN FRANCISCO		
Howard H. Jackson, Chief Eng.	OSS, any GT	RG
Sydney Jordan, Chief Eng.	OSS, any GT	RG
Emil Ziessman, Chief Eng.	OSS, any GT	RG
Melbourne E. Lewis, 1st Asst. Eng.	OSS, any GT	RG
Justus J. van Loben Sels, Jr., 1st Asst. Eng.	OSS, any GT	RG
Wilfred Allard, 2nd Asst. Eng.	OSS, any GT	O
Laurence E. Sutherland, 2nd Asst. Eng.	OSS, any GT	RG
Max V. Bentley, 2nd Asst. Eng.	OSS, any GT	RG
Chan Lyman, 2nd Asst. Eng.	OSS, any GT	RG
Charles G. Saunders, 3rd Asst. Eng.	OSS, any GT	O
Fred Wilhelm, Jr., 3rd Asst. Eng.	OSS, any GT	O
Elvin M. Zeller, 3rd Asst. Eng.	OSS, any GT	O
Robert O'Neill, 3rd Asst. Eng.	OSS, any GT	O
Nicholas M. Daniloff, 1st Asst. Eng.	OMS, any GT	O
PORTLAND		
John A. Christian, Chief Eng.	OSS, any GT	RG
Joseph Spataford, Chief Eng.	OSS, any GT	RG
Reider A. Kristiansen, 1st Asst. Eng.	OSS, any GT	RG
Frederick R. Sundquist, 1st Asst. Eng.	OSS, any GT	RG
Joseph B. Landy, 3rd Asst. Eng.	OSS, any GT	O
Herman O. Hendricks, 3rd Asst. Eng.	OMS, any GT	O
SAN PEDRO		
Harold Hanson, 2nd Asst. Eng.	OSS, any GT	RG
Charles E. Markey, 1st Asst. Eng.	OSS, any GT	RG
Ellis Beaumont, 3rd Asst. Eng.	OSS, any GT	O
Harry F. Miller, Chief Eng.	OMS any GT	O

Deck Officers' Licenses

The following list shows the licenses granted during the month of May to deck officers of the merchant marine at Pacific Coast offices of the Bureau of Marine Inspection and Navigation:

Name and Grade	Class	Condition
SEATTLE		
Paul Anderson, Master	OSS, any GT	RG
James H. Connelly, Master and Pilot	OSS, any GT	RG
Warren A.. Weymouth, 3rd Mate	OSS, any GT	O
William A. Fairweather, 2nd Mate	OSS, any GT	RG
SAN FRANCISCO		
Marcel Riousse, Chief Mate	OSS, any GT	RG
John A. Paterson, Chief Mate	OSS, any GT	RG
Floyd Nelson, 2nd Mate	OSS, any GT	O
Tom Westerling, 2nd Mate	OSS, any GT	RG
Charles C. Wright, Jr., 2nd Mate	OSS, any GT	RG
Charles A. Thau, 3rd Mate	OSS, any GT	O
William L. Bewley, 3rd Mate	OSS, any GT	O
PORTLAND		
Guy S. Thompson, Chief Mate	OSS & OMS, any GT	RG
Dewey E. Williamson, 2nd Mate	OSS & OMS, any GT	O
Walter A. Hughes, 3rd Mate	OSS & OMS, any GT	O
Hugh E. Shaw, Chief Mate	OSS & OMS, any GT	RG
George R. Roshcaln, Chief Mate	OSS & OMS, any GT	RG

Abbreviations: GT is gross tonnage; RG is raised grade; O is original license; OSS is ocean steamer; OMS is ocean motorship.

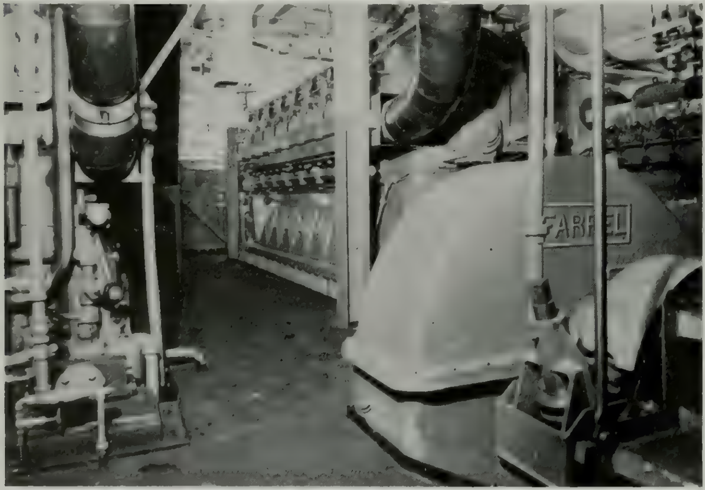
Modern Vessel Power Trends

By John R. West

The writer has just returned from a trip to the Great Lakes and East Coast. While on this trip he spent considerable time studying what appears to be a quite definite trend on the part of naval architects and vessel owners in the powering of commercial vessels. The following comments are the results of his observations.

The major interest seems to surround three classes of ships—the long discussed C-2 class of cargo carrier, towboats, and tankers. As has already been chronicled, the U. S. Maritime Commission has let contracts for twelve of the C-2 freighters. Eight of the ships will be diesel powered and four steam. Complete details on these vessels will soon be presented in this publication. Of the eight to be diesel powered, four will be equipped with medium speed diesels driving through reduction gears. All of the steam powered C-2's will be turbine powered, driving through double reduction gears.

In the towboat field, there are now being constructed four vessels of approximately 1000 S.H.P. each, using high speed diesel engines connected to generators, which in turn supply current to two high speed electric motors. Each of these motors drives one of the pinions or a Farrel-Birmingham single reduction gear which couples directly to the propeller shaft. The installations in these tugs are similar to the diesel electric reduction gear installation in the M. S. Wanderer, which has two diesel generating plants which supply power to two Elliott high speed motors coupled to the single pinion of a Farrel-Birmingham vertical offset reduction gear. The success of the installation in the Wanderer is partially responsible for the similar layout on the four tugs.



Engine room of Army Engineers dredge Pacific, featuring the starboard propulsion engine and the horizontal offset Farrel-Birmingham reduction gear. The application of this gear to both engines allowed room between them for a large diesel generating set.

In the tanker field two definite trends are obvious. One is to the use of medium high speed diesel engines with individual reduction gears—the other is the use of twin diesel engines coupled, through electric couplings, to one propeller shaft. Representative of the first trend are the recently built Ford motorships which are each equipped with two 600 H.P., 600 r.p.m. Cooper-Bessemer engines driving the propeller shaft through 3:1 ratio, vertical offset Farrel reduction gears. Indicative of the second trend—of coupling two medium high speed diesels to one propeller shaft—are two tankers now being built for operation from Vancouver, B.C. These vessels will be in service this summer and are powered with two diesels, each rated at about 600 H.P. at 400 r.p.m. Electric couplings, of the Farrel-Elliott type, isolate any torsional vibrations from the Farrel-Birmingham gear sets. Propeller speeds of 125 r.p.m. will be used.

Based on the definite trend toward the use of reduction gears, the outline drawings shown herewith explain some of the reasons behind the trend.

As a means of presenting a comparison between direct driven propellers and reduction-gear driven wheels, four standard makes of engines have been analyzed. In all four cases, the effort was made to deliver about 1200 H.P. at the propeller. It was not possible to select engines which exactly did this, but the table below indicates the essential facts:

ive Type	H.P.	B & S	E-r.p.m.	P-r.p.m.
-Direct	1200	20″ x 24″	200	200
Gear	2-612	14½″ x 18″	360	112.5
Gear	2-625	12″ x 15″	480	150
Gear	2-625	10½″ x 13½″	600	187.5

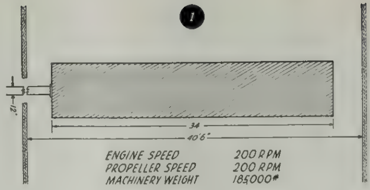
To make the comparison even more curate, the slight mechanical and ectrical losses in the electric coupigs and the reduction gears are dected, in the table below, from the ted H.P. of the engines:

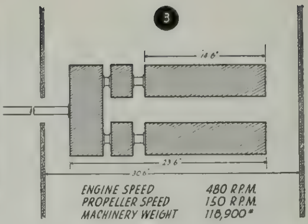
e	H.P.	P-R.P.M.
Direct	1200.0	200.0
Gear	1168.4	112.5
Gear	1193.2	150.0
Gear	1193.2	187.5

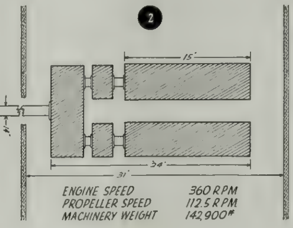
In all three gear drive cases, the duction ratio was left constant as means of simplifying weight and ace calculations.

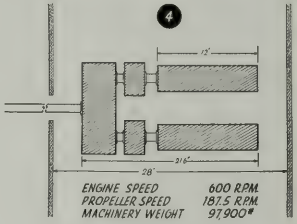
It is interesting to note, by reference to Fig. 2, that even when relavely slow speed engines are coupd together on one shaft the total achinery weight is 21 tons less than e single direct connected engine own in Fig. 1. If consideration is nfined to the use of such a power ant on a tug, the weight reduction of no consequence except in the e respect that additional fuel can carried without any increase in aft. The saving of about 10 feet, re and aft, in engine room space of no great value, unless crew arters are below deck, in which se the quarters could be enlarged nsiderably. The greatest advantage in the towing ability of the 112.5 .m. wheel as compared to the 200 .m. wheel of the direct drive mainery, which is an advantage that obably no towboat operator would derestimate.

Figure 3 shows what can be acmplished by using medium high eed engines. The saving of some tons in machinery weight, as comred to the direct drive installation, oadens the field of applications cause, among fishing vessels and eighters, the 33 ton saving permits definite increase in the vessel's rnings. Shortening of the engine om by 10½ feet is a definite adntage, permitting considerable adtional cargo space. For the average eighter, tanker, or fishing vessel, wheel speed of 150 r.p.m. is nearly eal—which this installation permits.









The ultimate in space and weight savings is obtainable by the installation shown in Fig. 4. Here a total of 13½ feet fore and aft is gained and 43½ tons of machinery weight eliminated. The wheel speed has increased to 187.5 r.p.m. in this case, as compared to the preceding case of 150 r.p.m. Nevertheless, the efficiency of a wheel turning 187.5 is recognized as superior to 200 r.p.m. in the case of the direct-driving installations.

Even in smooth sea conditions the increased propeller efficiency will more than compensate for the difference in fuel consumption between the 1250 installed H.P. driving through gears, and the 1200 H.P. direct connected. If it had been necessary to go up to 200 r.p.m. on the gear drive installation, the 43½ tons of **additional** cargo capacity would mean an enormous increase in yearly profits from the vessel—without sacrificing any wheel efficiency or fuel economy.

● Initial Cost Considerations.

A splendid opportunity recently presented itself to analyze the initial costs of direct driving machinery as compared to diesel gear drive. The case in question was a large car ferry which required approximately 1000 H.P. Three alternatives were open to the operator:

(1) Diesel electric drive.
(2) Diesel gear drive.
(3) Direct drive.

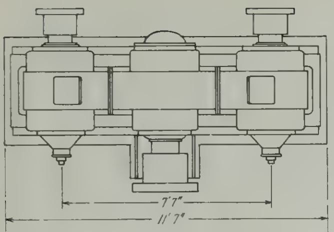
The diesel electric installation involved two 660 H.P. engines driving generators, and one 1100 H.P. electric propulsion motor. The diesel gear plant involved two 605 H.P. engines, electric couplings and reduction gear. In the case of the direct drive, a 1100 H.P. engine at 200 r.p.m. would have been used. The variance in H.P. is to compensate for the electrical, mechanical, and propeller efficiencies. In the final analysis, the relative costs per H.P. for the diesel gear and diesel electric drives, as compared to the direct connected engine, were:

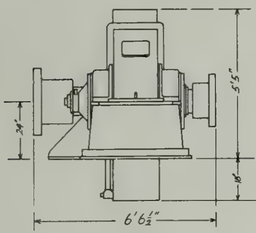
(1) For diesel gear drive: 96% of direct drive cost.

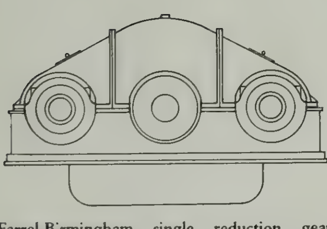
(2) For diesel electric drive: 126% of direct drive cost.

In other words, to use direct drive would cost more than the diesel gear drive, with diesel electric drive the highest in cost. The difference between the direct drive cost and the gear drive is attributable to the fact that the cost per H.P. of building a medium speed diesel is considerably less than the cost for a slow speed engine. And the difference between the two is more than sufficient to cover the cost of the gears and couplings. While this statement is not true in all cases, nevertheless in the majority of cases it is.

It is because of the facts presented above, as to weight, space, and costs, that the trend is so strong toward the use of reduction gear drives for new vessels. The effect it has upon con-






Farrel-Birmingham single reduction gear with 2 pinions for connecting two 600 H.P. diesels to a single screw shaft.

versions of steam vessels to diesel is also important to consider. Many operators of coastwise and harbor tugs who for years have recognized the fuel economy of diesel engines, but who have also been reluctant to go to higher propeller speeds, can now look upon the speed reduction gear as a means of obtaining all the advantages from diesel engines.

Referring again to Fig. 2—where two 612 H.P., 360 r.p.m. engines drive the propeller at 112.5 r.p.m.—such an installation would be particularly adaptable to Pacific Coast tugs which are now steam powered. It would permit the swinging of a highly efficient propeller—and because of the electric couplings, the machinery would be extremely flexible during ocean towing operations. In a heavy sea, when a single steam or diesel engine would normally be slowed down to half speed, in this case one of the two engines could be shut down completely, because to disconnect the electric coupling it is merely necessary to pull a switch. This not only would result in the fullest possible fuel economy from the operating engine, but also would permit repairs and adjustments while underway to the other engine, should any be needed.

To the fishing or freight vessel operator, whose vessels can efficiently use propellers turning between 150-200 r.p.m., the substantial weight and space savings made possible by the plants shown in Figs. 3 or 4 are immediately interpreted into profits.

An interesting study was made of two Ford canal freighters which illustrates this statement. One vessel was the turbine powered Edgewater, and the other was the diesel gear powered Green Island. Each was identical in the following respects:

Length over all	300'
Beam	43'
Draft	9' 6"
Displacement	2922 tons

The steamer Edgewater was of riveted construction and the diesel gear Green Island was entirely welded. Combining the reduced weight and space of the diesel gear drive machinery with the weight saved by welded construction, the two vessels compared as follows:

	M.S. Green Island	S.S. Edgewater
Hull weight	689 tons	746 tons
Machinery	70 tons	187 tons
Fuel oil	85 tons	186 tons
Lube oil	5 tons	2 tons
Water	7 tons	65 tons
Shaft H.P.	1200	1600
Cargo capacity	2182 tons	1852 tons

It is interesting to note that in obtaining 17.8% **more** cargo capacity, the cost of building the motorship was approximately 30% **less** than the steamer. Part of the reduced cost is, of course, due to the lighter weight of the welded hull, and second, to the lower H.P. ratings of the machinery. Operating experience has proved, however, that the motorships are able to maintain the same schedules as the steamers, despite the higher rated power of the steamers.

The engines in the Ford motorships are Cooper-Bessemer 8-cylinder units, rated 600 H.P. at 600 r.p.m. Farrel-Birmingham vertical offset reduction gears of 3:1 ratio are between the engines and the propellers. When the motorship Green Island and its sister ship Norfolk were still on the drafting boards, the architects analyzed the comparative weights of diesel direct drive and diesel gear drive machinery. They found that, even though they used 300 r.p.m. direct drive engines, there would be a weight saving of 80,000 pounds by using gear drive. Furthermore, the latter permitted 200 r.p.m. on the propellers in place of the less efficient 300 r.p.m. if the wheels were direct connected to the engines.

In summary, it is the writer's hope that the material presented in this article may direct some thought by vessel operators on this coast towards the use of modern diesel gear drive machinery as a means of obtaining better propulsive efficiencies and at the same time increasing cargo capacities.

Book Review

1938 Pacific Coast Directory of Transportation, published annually by the Shipping Register, San Francisco. 168 pages neatly printed and attractively bound in stiff paper. Price 50 cents.

This 1938 edition is the largest and most complete Shipping Register Directory ever issued. It contains vital information, phone numbers, addresses and personnel of all Pacific Coast transportation and allied firms, conveniently arranged by cities, including Aberdeen, Astoria, Bellingham, Coos Bay, Everett, Grays Harbor, Hoquiam, Long Beach, Los Angeles, New Westminster, B.C., Oakland, Olympia, Portland, San Diego, San Francisco, San Pedro, Seattle, Stockton, Tacoma, Vancouver, B. C., Vancouver Island cities, Victoria, B. C., Willapa Harbor, and Wilmington.

All firms doing business with the Pacific Coast marine market should keep a copy of this book on the desks of all executives.

SAN FRANCISCO
PUBLIC LIBRARY
PERIODICAL DEPT.

New Steel Motor Ferry "Governor Harry W. Nice"

his vessel, designed and built by Ki pers Company's subsidiary, the M: yland Drydock Company, for the Cl rbotne-Annapolis Ferry Compa ', is classed A-1 Ferry Service wi the American Bureau of Shippi , and meets all requirements of th Bureau of Marine Inspection and Na igation.

ne main deck is arranged for carri e of automobiles and trucks in si lanes, with loading gangways at ea end. A center house, 7 feet 2 in es wide, encloses the engine casin crew toilet spaces, access stairs to rew quarters on lower deck and pa enger stairs to the upper deck.

here are crew accommodations fo 22 persons. Galley and mess ro ns are located on the lower deck in hold compartments adjacent to ea end of the engine room.

he upper deck house, about 100 fe long, extends the full length of th upper deck and comprises two el ated pilot houses, four staterooms fo officers, toilet space for officers ar for white and colored passenge , and a large passenger saloon, ab t 38 feet wide by 50 feet long, wi a lunch counter.

MAIN PARTICULARS

Length overall	207 ft. 6 ins.
Length between perpendiculars	191 ft. 6 ins.
Length on 8 ft 9 in waterline	204 ft. 6 ins.
Beam over guards	62 ft.
Beam molded at Main Deck	60 ft.
Beam molded at 8 ft. 9 in. waterline	40 ft.
Depth molded to Main Deck at side	14 ft. 6 ins.
Designed draft, molded	8 ft. 9 ins.
Displacement, molded at 8 ft. 9 in. draft S.W.	977 tons
Frame spacing, 18 inches in ends 22 inches elsewhere .	
Rudder stock diameter	6¾ ins.
Number of vehicle driveways	6
Automobile carrying capacity	65 cars
Passenger capacity	730 persons
Brake horsepower, Main Engine	1400
Speed, normal, miles per hour	12
Fuel capacity, gallons	8,000

Two balanced rudders, one at each end of the vessel, are operated by electric steering engines, arranged for hand operation in case of failure of electric power.

Fuel oil is carried in two built-in double-bottom tanks, one located in each hold adjacent to the engine room. Potable water is carried in one 500-gallon cylindrical tank located in the hold.

The double-ended, flared hull is subdivided by six main bulkheads so located that the vessel will have ample freeboard and positive stability with any one compartment flooded.

Motor ferry Gov. Harry W. Nice on trials.

## ● Steel Structure.

The vessel is designed to withstand ice breaking. The rudders are protected by stern frame horns extending well below the waterline. Shell plating in the way of the ice belt is half inch thick throughout.

The hull and superstructure are generally of steel construction, riveted or welded. The use of wood has been limited to the fender guards and parts of the joinerwork.

Cast steel end frames extending to the main deck are made in two pieces, riveted together over the wheel apertures. A heavy skeg extends from the bottom of each frame to support the lower rudder pintle bearing.

The rudders have cast steel frames covered with steel plates and are filled with Hydrolene. Each rudder is carried on a roller bearing supported from the underside of the main deck. Rudder stock bearings, two feet long, cast integral with stern frames, have brass bushings and stuffing boxes. The forged steel rudder stocks have horizontal lower palm bolted to the rudder frame. Rudder quadrants are of cast steel with 4 foot 6 inch radius.

A center keelson, a 24-inch by 79.9 pound eye beam, is continuous between the end frames, with its depth slightly reduced in the way of main engine foundations.

A system of wide fore and aft web frames has been used in the engine room in place of the usual diagonal truss work, and this greatly improves appearance and accessibility.

Stairways are of fireproof construction and have heavy gage pressed steel risers and treads, covered with red colored magnite. Handrails are of 1¾ inch O.D. brass tubing.

● Equipment and Outfit.

Two 18 person, 20-foot lifeboats are stowed on the upper deck under rotating davits.

There are two spirit compasses and compensating binnacles.

A 4-foot long, two oven galley range, fitted with a carburetor for burning diesel oil, is provided in the galley and connected to a 50-gallon range boiler.

There are one 30-cubic foot electric refrigerator for the galley and two electric drinking fountains for the passenger saloon. All are self-contained, air-cooled units.

All dressers in the galley, mess room and lunch stand are of steel construction with stainless steel sinks and tops. The galley sink is discharged overboard by a motor-driven centrifugal pump.

Linoleum floor covering is fitted in the pilot houses, passenger saloon and officers' staterooms on the upper deck. White ceramic tiling is laid in the toilet spaces and red magnite in the lunch stand and on the stairways. There are galvanized steel pipe standee berths and berth springs for officers, as well as mattresses and pillows. Each member of the crew also is provided with one steel locker, size 15 by 21 by 78 inches.

Handrails on each side of the passenger stairs from the main to the upper deck are of 1¾ inch O.D. No. 12 gage brass tubing. Other handrails outside of machinery spaces are of galvanized pipe.

● Hull Engineering.

Hand and power steering are provided with two electro-mechanical steering engines operating quadrants through wire rope transmission from the steering engine drums. The engines are controlled with bevel gears and shafting from the pilot houses. In case of electric power failure, automatic change-over to hand steering is effected. Emergency steering also is provided by means of an emergency tiller fitted over the upper end of either rudder stock and handled with block and tackle.

Mechanical ventilation of the engine room and crew quarters below the main deck is provided with four electric blowers, two supplying the machinery space and two for accommodation spaces on the lower deck. Natural ventilation also is provided for the galley.

An oil-fired steam heating boiler is installed in the engine room and piped to fin-type cabinet radiators in all quarters except the passenger saloon, which is heated by two fan heaters.

The discharge from the fan heaters is led through overhead ducts and escapes into the saloon space through four combination diffusers and electric ceiling fixtures which, in association with well placed wall fixtures, complete the saloon lighting system.

The fan heater system is used also as a ventilation system during summer weather.

Plumbing fixtures throughout a chromium plated. Hot and cold ru ning fresh water is supplied to th showers and lavatories.

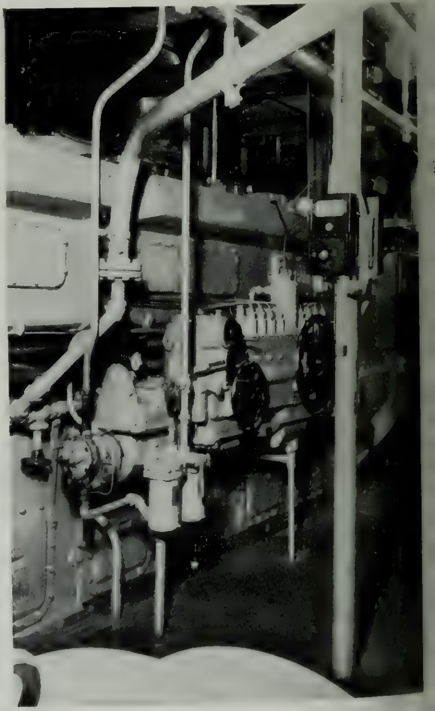
The usual fire main, hydrant an hose system is installed. In additio the automobile space on the mai deck is protected by a sprinkler sy tem of the zoned, dry pipe type co nected to fire pumps.

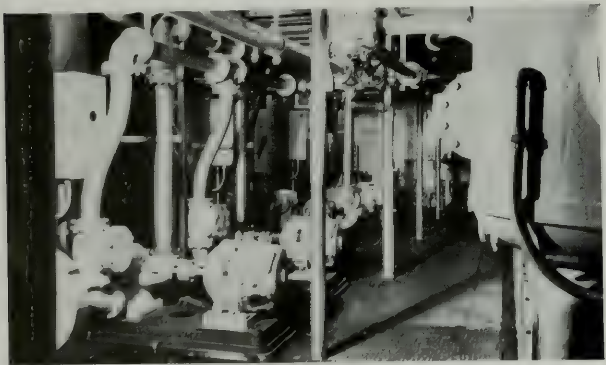
● Machinery.

The propelling machinery, wit auxiliaries, was furnished by Fai banks, Morse and Company and co sists of one 8-cylinder air starting cycle direct-reversible single-acti solid-injection air-scavenging mai engine of 1400 S.H.P. at 300 r.p. arranged for double-end drive wit thrust bearings and flexible cou lings at each end.

The propellers are 82 inches in d ameter by 60 inch pitch and are the solid bronze, 3 blade type, po ished and balanced. The stern tub are cast iron heavily ribbed and hel in place by a wrought iron nut; th after end is fitted with a cutle

At right: The control stand of the 400 S.H.P. Fairbanks-Morse diesel engine. Below: Some of the auxiliary motor drive pumps in the engine room.





b ring, water for which is furnish e by the cooling system.

he auxiliaries consist of:

wo 80 K.W. - 120 volt marine type . generators, direct connected to d sel engines, and one emergency b d starting diesel air compressor;

wo fresh water cooling pumps w h water cooler;

wo salt water cooling pumps;

wo lubricating oil pumps with oil c ler;

wo fire pumps with bilge connec t s;

ne bilge pump;

ne independent fuel oil transfer p np;

ne independent lubricating oil t nsfer pump;

ne lubricating oil centrifuge;

wo fresh water sanitary systems;

ne salt water sanitary system w h a connection to the salt water c ling system for emergency use;

wo air compressors, with five air t ks.

ll auxiliaries are motor-driven w h push button control;

a l the total connected electric load a ounts to 76 K.W., of which the r nning load will be about 60 K.W. ch generator will be capable of c rying any emergency load.

he switchboard is arranged with louble throw stitch between the power and light panels to accommodate the shore current when the vessel is at the dock and the ship's generators are not running. Each auxiliary has an independent connection on the switchboard, the larger units being protected by circuit breakers.

The salt water cooling system is taken from a built-in sea chest, the area of the strainers being about ten times the area of the cooling pipes. A feature of the cooling system is a means provided whereby the cooling water may be returned to the sea chest for melting any ice trapped in the chest when the vessel is operating through the winter months.

The fresh water cooling system is as simple as can be arranged. The water leaving the engine is delivered to a surge tank placed above the engine, where the air is removed; from the surge tank the water is cooled and delivered to the cooling pumps which return it to both the main and auxiliary engines. The cooling system is arranged to be entirely independent for the auxiliaries in case of repairs to the main engine.

The lighting system employs the standard marine type fixture except in the engine room and auto driveways, where water and vapor-proof fixtures are provided with reflection, giving a more uniform distribution of light.

A Remarkable Diesel Maintenance Record

he Golden Gate Ferry Company, erwards merged into the Southern cific - Golden Gate Ferry Com y, was a pioneer in the applica 1 of diesel electric propulsion to omobile ferry service. After con erable experience with that type drive in conversion jobs, they de ned and built four ferries which e delivered in 1927-28.

hese ferries, known as the Golden e, had the following characteris :

Length overall	240′ 0″
Beam molded	44′ 0″
Beam over guards	60′ 0″
Depth molded	17′ 0″
Speed, light	13.5 knots
Speed, loaded	13 knots
Auto capacity	85
Seating for passengers	350

The power plant for these boats consists of three 4-cycle, 6 cylinder, solid injection type Ingersoll-Rand non-reversible diesel engines each developing 400 B.H.P. at 265 r.p.m. and each directly connected to a 275 K.W. 250 volt Westinghouse direct current generator.

These engines are 14 inch cylinder bore and 19 inch piston stroke.

The generators operate in series and deliver current at 750 volts.

The boats have propellers at each end. Each propeller is driven independently by a Westinghouse 950 H.P. direct current motor. These motors are controlled so that the after motor takes all the propulsion load, and the forward motor idles at a speed insuring zero slip on its propeller. The boats do not turn around at ends of run, so that the motors alternate in their functions.

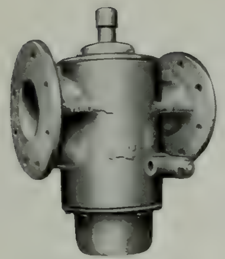
For nearly eleven years these four boats operated steadily in a ferry service requiring 24 hour service or a 14 to 16 hour service continuously. During all of this service the engines would be on full load for 17 to 20 minutes and idling for 10 minutes. A recent examination of the liners of these 72 cylinders prior to sale of the fleet to Puget Sound interests revealed the interesting fact that average wear of the Ingersoll-Rand liners over this entire period was slightly under 0.060 inches.

This is a remarkable performance and reflects great credit on the designers of these engines, the material used in the liners, and the superintending engineer of the Southern Pacific-Golden Gate Ferry Company.

One of the "Golden" type diesel-electric drive motor and passenger ferries recently sold to Puget Sound interests by the Southern Pacific-Golden Gate Ferry Company.

New Tanker Fittings

California Firm Develops Four New and Useful Fittings for Oil Tankers



Cargo breather valve.

The Shand and Jurs Company of Berkeley, California, which has for many years manufactured fittings for refinery storage tanks and truck tanks, has recently placed on the market four new fittings especially designed and built for use in the marine field in connection with oil tankers.

The first of these fittings is a 4" marine cargo breather valve. This valve is designed to conserve the volatile gases rising off petroleum cargoes on tankers or barges. The fitting is of all bronze construction with special vapor proof non-sticking material on the valve seats. It is of the vacuum and pressure type with the pressure outlet flanged for connection to a vapor line and the vacuum side taking in directly from the atmosphere.

Adjustment for varying load requirements is provided. The standard loading is 3 lbs. on pressure side, 1½ lbs. on the vacuum side. At this loading the valve provides ample venting capacity for individual cargo tanks up to 6500 barrels capacity.

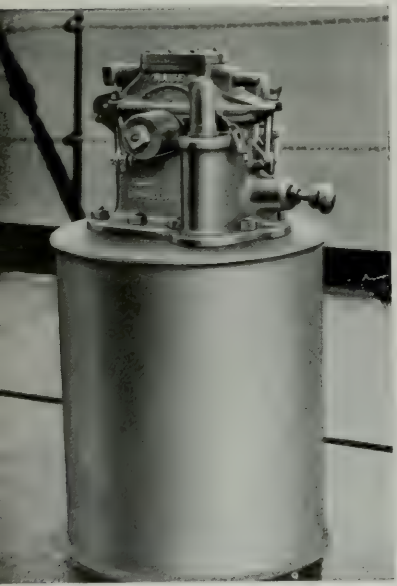


Figure 2 shows a vacuum and pressure gage designed for installation in the engine room or chief engineer's quarters aboard an oil tanker to indicate the pressure or vacuum conditions in the main inert or flue gas line. Adjustable rod contacts project into mercury tubes which make an electrical contact for sounding an alarm or operating any electrical signaling device when the pressure or vacuum conditions exceed predetermined limits.

Figure 3 shows the three sizes of a steam jet exhauster, designed to gas-free oil tanker compartments immediately upon discharge of the cargo. This new exhauster is essentially a steam vacuum pump, designed not for high vacuum, but rather for large carrying capacity and minimum steam consumption. These exhausters are manufactured in three sizes, 4", 10", and 12", having net capacities of from 60,000 to 750,000 cubic feet per hour, which is sufficient to insure a quick and complete renovation of the air in a tank compartment with no consideration of or dependence upon wind conditions.

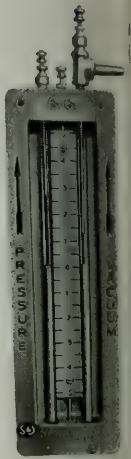


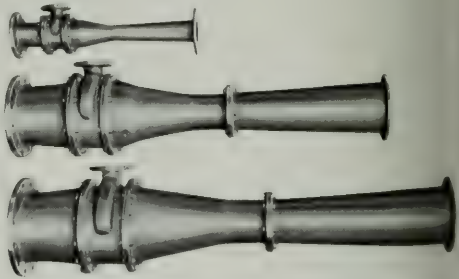
Fig. 2

Figure 4 indicates the external appearance of an automatic tank gage for giving a quick, accurate and safe measurement of the contents of oil tanker or barge cargo.

This new gage eliminates the vapor losses and hazards attendant in open hatch gaging. The gage employs a float hung on a measuring tape and guided by a stainless steel wire. The tape is read through a heavy glass window equipped with a wiper. The gage may be mounted flush with the deck or on a trunk to elevate it above the sea wash. A hanger is provided for supporting the float at rest when tank is empty.

All of these fittings are designed with the idea of promoting the progress of development in the safe and economical marine transportation of petroleum and petroleum products.

Although quite new, they have already been adopted as practically standard equipment for new Pacific Coast tankers and are being used in many reconditioning jobs.



At right. Fig. 3.

At left, Fig. 4.

afe Transportation on San Francisco Bay Ferries

erry transportation of automobi s and passengers across San Fr ncisco Bay and its tributaries ha been developed into a fairly unifie system with a very high rating in ll matters pertaining to safe, depe lable schedules and to economy in perations. The record in passenge transportation runs back over 75 ye s and that for automobiles about 35 ears.

rincipal passenger and automobi route is that connecting the ce er of San Francisco waterfront wi Oakland. Two systems of interu an electric lines cover the Metro litan Oakland areas on the East sh re of the Bay. These are the S thern Pacific Lines and the Key Sy tem, and each operates a 20-minut ferry service across the Bay of S Francisco. These two ferry syste s handle over 22 million passeng annually, and that is some passe ger traffic in any man's language.

uring the development of this fe y business, there have been many a ievements and not a few records. A ong these are:

he largest ferry steamers.

he first diesel electric ferries in A erica.

he first turbo electric ferries in A erica.

he transporting of over 300,000,0 passengers by one company duri a 20-year period without losing a assenger.

better overall safety record than a comparable ferry service.

ith all these facts in mind, Walte Kidde & Company, Inc. and their S Francisco representatives, H gh and Egbert Inc., are justly p ud that practically all of the o rators of steam ferries on San F ncisco Bay chose Lux carbon d xide fire extinguishing equipm nt when outfitting their vessels w h bilge flooding systems in the e ine and boiler room spaces as r uired in recent regulations of the Bureau of Marine Inspection and Navigation.

The San Francisco Bay ferry firms and vessels recently installing this equipment include:

Sacramento Northern Railway Co.

Gasoline engine screw ferry Ramon.

Martinez-Benecia Ferry Co.

Sc. st. ferry Issaquah.
S.W. st. ferry City of Seattle.

Richmond-San Rafael Ferry Co.

Sc. st. ferry Sonoma Valley.
S W. st. ferry City of San Rafael.
S.W. st. ferry City of Richmond.
S.W. st. ferry Charles Van Damme.

Key System

St. tu. el. ferry San Leandro.
St. tu. el. ferry Hayward.
St. tu. el. ferry Yerba Buena.
S W. st. ferry Treasure Island.

Southern Pacific Ry. Co.

S W. st. ferry Sacramento.
S W. st. ferry Santa Clara.
S.W. st. ferry Alameda.
S W. st. ferry Oakland.
S W. st. ferry Piedmont.
Sc. st. ferry Berkeley.
Sc. st. ferry Sierra Nevada.

Northwestern Pacific Railway Co.

S.W. st. ferry Tamalpais.
S W. st. ferry Cazadero.
S.W. st. ferry Eureka.

These 21 ferries include a wide range of steam power plants and one gasoline engine plant. Incidentally, this gasoline engine on the Ramon is said to be the largest in the world (600 H.P.) and it drives through direct connection friction clutches a screw at each end of the boat.

The steam plants range in capacity from 250 to 2500 shaft horsepower and include: single cylinder long stroke condensing engines working the paddle wheel shafts through overhead walking beams; two inclined compound condensing engines each driving one side paddle wheel; triple expansion condensing engines direct connected at each end to propeller shafts; and steam turbine electric propulsion with complete pilot house control of the propulsion motors.

The ferries range in size from 180 gross tons to 2400 gross tons.

New Shell Pier at San Diego

Construction of a new pier to serve the Bay of San Diego was started June 15 by Shell Oil Company, according to announcement from company headquarters. The new pier is situated at the foot of Crosby Street on the same site as the present pier, but will be much larger and will embody the most modern equipment and conveniences for marine business.

Building of the new structure will not interfere with service, as plans have been worked out for carrying on the work of erecting the new pier while service is continued on the old. The new structure will have a two-lane approach 16 feet in width, extending 200 feet from shore to the service portion of the pier, which will be another 100 feet long and 24 feet wide.

Sufficient draft and mooring space to accommodate any type of fishing, commercial or pleasure boat will be available at the Shell pier. In addition, it will have a float anchored on the south side to accommodate smaller boats.

The complete line of Shall marine supplies will be stocked at the pier, including Super Shell gasoline, Dieseline, Golden Shell Marine Oil, and other fuels, lubricants and specialties. Courtesy services provided for boat operators and crews will include fresh water, telephones and rest rooms.

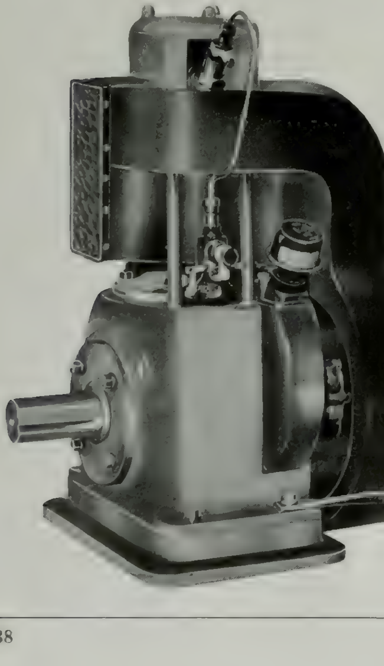
A New Air Cooled Diesel

Standard Gas Engine Company Develops a Successful Diesel Engine for Low Power Applications on Board Ship

Standard Gas Engine Company of Oakland, California, is a well-known and highly respected name in the history of the development of internal combustion engines on the Pacific Coast. Born at the opening of this century and fostered by men of long previous experience, Standard soon developed marine propulsion units ranging up to 200 H.P., and a complete line of gasoline engine driven marine auxiliaries. We read in the pages of the issue of Pacific Marine Review for June, 1915, of the exhibit of Standard Gas Engine Company: "It is probable that no other exposition has ever had so many gas engines exhibited by one firm, for in the Standard's big space in the heart of the Palace of Machinery there are forty different sizes of engines on display, ranging from four to two hundred horsepower, and embracing stationary, marine, hoisting, electric, and pumping sets."

At that time the Standard Gas Engine Company was very busy filling a "steady demand for their engines in the Orient, Hawaii, Alaska, Australia, and at home on the Pacific Coast."

Standard Gas Engines were labeled "Frisco Standard," and this trade mark became a synonym for reliability and service. At the present time from the Standard plant in Oakland spare parts are being shipped daily to many out-of-the-way corners of the world. Just the other day came in an order from Alaska for some new bearings for an old type Frisco Standard, with the comment: "'This is the third boat I have built around this engine."



A very neat, shipshape job is this Model A Little Giant "Frisco Standard" one cylinder air cooled diesel engine. It delivers a dependable 5½ H.P. at 1200 r.p.m. and 7½ H.P. at 1500 r.p.m.

We cite these facts to show that the Standard Gas Engine organization has back of it a wealth of practical experience. Granting this to be so, an announcement of a new engine coming from such a source is important enough to demand thorough investigation by interested parties.

For several years the technical department of this firm has been experimenting with the idea of designing an engine in the power range below 20 H.P. that would work on the diesel cycle with good economy, that would be light in weight, low in cost, simple in design, and reliable in performance.

The result of this experiment and research is now announced as the "Little Giant" air cooled diesel engine, a very compact, very simple, low cost, low weight, dependable power unit. For over ninety days the first unit of this engine has been under test at the Oakland plant of the company. During those three months it has met every test satisfactorily. Run at full and overloads continuously for ten hours at a time, it shows: A capacity well above its rating; an excellent fuel economy for such a small unit; very good torque characteristics; clean exhaust at all loads; and no tendency to overheating.

One notable characteristic of this engine is its remarkable idling ability. It chugs along very nicely at speeds as low as 350 r.p.m. with apparently perfect combustion and no tendency to stall. This should be of great interest to many fishermen and others who desire to have dependable slow speed in small boat propulsion.

The results of standard tests at varying loads and speeds are shown in the graph herewith, in which the dotted line denotes the actual horsepower generated at the speed and the full line shows the horsepower rating at that speed. Here we note that from 12[illegible] r.p.m. to 1600 r.p.m. we have the maximum torque and the minimum fuel consumption (approximately 0.45 pounds per brake horsepower hour). Between these two speeds the one cylinder engine ranges from a rating of 5½ horsepower, with an actual 6¼ horsepower, to a rating of 7½ horsepower, with an actual eight horsepower.

It is claimed that this engine as a driving unit for a modern 5 K.W. generator will produce electric energy at an operating cost of less than one half cent per kilowatt hour.

No investigation of a prime mover is complete unless we take the unit apart to "see what makes the wheels go round." With the Little Giant Frisco Standard this is very easy. Only one tool, a 7/16 inch standard wrench, is needed, and in less than 20 minutes the parts of the engine are all on the floor. An ordinary mechanic or deckhand can put it together ready to run in half an hour.

Inside we find that the cylinder has a bore of 3¾ inches and that the piston stroke is 4¼ inches, giving a piston displacement of 47½ cubic inches. There is a pre-combustion chamber of exclusive design which gives two stage controlled combustion. The piston clearance and combustion chamber volume is designed to approximately 450 lbs. compression pressure and an initial pressure of fuel injection of about 900 pounds. These are ample to insure ignition temperatures for any ordinary diesel engine fuel. Fuel is injected in a fine spray by the Bosch System, passing through a Framm filter on its way to the injection nozzle.

The engine works on the four cycle principle. Air inlet and exhaust valves are of ample capacity to insure abundance of combustion air clean scavenging. The cylinder cylinder head are of special y cast iron and both are designed h scientific accuracy to produce ple radiating surface to the cool- air so as to keep all parts of the nder at the proper temperature economical and dependable operon.

Fitted with five rings, the cast n piston is designed to take a lock- wrist pin, with the pin bearing in eye of the connecting rod. This rod is drop forged of chrome nickel steel, heat treated, and is fitted at each end with oversize capacity bearings of the highest grade materials.

A 2¼-inch drop forged chrome nickel steel crank shaft runs in tapered roller bearings. This shaft is oversize, is specially heat treated, is fully counterweighted, and is completely balanced for operating speeds.

The flywheel is designed so that its spokes act as blades of a fan scientifically proportioned to deliver the correct volume of cooling air through the streamlined housing which surrounds the wheel and the cylinder.

In the base of this engine the crank case chamber has a capacity for four quarts of lubricating oil. This oil is pumped by a gear type pump through a Framm filter at a pressure of approximately 45 lbs. and sprayed on the running parts of the engine.

Speed control is maintained effectively by a simple governor of the flyball type acting on the fuel pump mechanism.

Putting the parts together again, one is surprised at the ease of the operation. There is apparently only one way in which it can go together and each part falls naturally into its place. Altogether it commends itself as a neat, well designed unit. Measured, it shows all over dimensions to be: height, 29 inches; length, including 4-inch shaft extension, 20 inches; width, 18 inches. Putting it on the scales reveals a total weight of 370 lbs.

It appears to us that this low cost, low weight, simple and economical prime mover would be an ideal power unit for many marine applications:

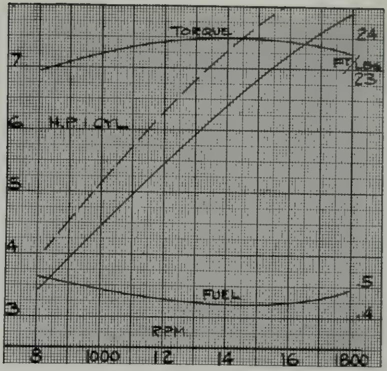
(1) As a propulsion unit for boats, such as lifeboats, pleasure craft, yacht tenders, small fishing boats, it would provide very economical power and would eliminate the gasoline fire hazard;

(2) As a power unit for electric generating sets of from 5 to 10 K. W. capacity on tugs, cargo carriers, yachts and many other types of vessel it would provide very economical main or emergency electric power;

(3) As a source of emergency power in multiple units, it would provide dependable electric energy for all necessary emergency functions on any ship. A number of small units of power have a very obvious advantage as an emergency source of energy when compared to a single large unit. They are more readily installed in the required position without disturbing ship structure. They furnish the safety that goes with numbers.

The Little Giant Frisco Standard air cooled single cylinder diesel is now in process of production. The first standard unit will be finished just about the date of the appearance of this article.

Diesel engines in this range of powers have not received much attention from American manufacturers, although many have been brought out in Europe. The old established Standard Gas Engine Company is therefore pioneering in a field that is new both for itself and for the diesel engine industry in America.



Graph of curves plotted from test readings showing performance characteristics of the Little Giant Frisco Standard diesel engine. Full line is curve of rated horsepower; dotted line is curve of actual horsepower.

Literature of the Industry

Velocity Stage Turbines. Small steam turbines for driving auxiliary machinery, such as generators, pumps or fans, are described in Catalog C issued by the De Laval Steam Turbine Co. These turbines are of the velocity stage type and, when operated at suitable speeds, as in connection with high speed machinery or by the use of speed reducing gears, and exhausting to back pressure, show good efficiency. The design has been specially adapted to the use of high pressure, high temperature steam by locating the steam chest in the upper part of the casing cover, where it is above and well removed from the bearings.

The End Suction Centrifugal Pump, style CRV, built in capacities up to 1000 gallons per minute for heads up to 500 ft., is the subject of a new bulletin released by Ingersoll Rand.

This pump offers single or two stage construction, open or closed impeller, and a variety of drives, including electric motor, steam turbine, gasoline engine or belt. The use of the open impeller in conjunction with a hand hole suction piece has proved invaluable in food plants and paper mills where heavy liquids are handled. The CRV pump has found wide application in many industries because of its high efficiency, low price and strong, sturdy construction. The liquids it has been used to pump include water, gasoline, fuel oil, caustic soda, quenching oil, phosphate liquid, brine, ammonia, fruit juice, starch, white water, naphtha, benzine, alcohol, alum, molasses, sugar liquor, and paste paper stock.

Convertible Gas and Diesel Engine, bulletin 3600-A-3 of Fairbanks, Morse and Co., announces and describes a series of four-cycle, vertical, convertible diesel and gas engines. This new Model 36-A-8 size fills a definite need for sturdy, medium-speed engines in the 200 to 300 H.P. range. Built in both six- and eight-cylinder combinations, with 8-in. bore and 10½-in. stroke, they develop 35 H.P. per cylinder at 720 r.p.m. Smaller sizes of Model 36-A diesel are available in ratings as low as 8 H.P.

Both diesel and gas engines in the new 8-in. cylinder size are offered for stationary service, and the diesels are offered for marine propulsion and in complete, unit-built Fairbanks-Morse generating sets as well. The diesels for marine service are direct-reversible, but can be furnished as non-reversible where such service requires.

Enbloc construction is employed, with individual cylinder liners, precision main, connecting-rod and camshaft bearings, and suspended or "underslung" crankshaft. Side cover-plates permit easy accessibility to main and connecting-rod bearings. The design permits double-end drive or power take-off from either end, a distinct advantage in certain types of application.

The resulting engine is extremely simple, neat in appearance, completely self-contained, sturdy and dependable, with excellent fuel and lubricating oil economy.

New U Bolt Gate Valves, folder No. 179, Jenkins Brothers, describes a new "Bronze Mounted" and "All-Iron" U Bolt Gate Valve with a renewable "Bonnet-Saver-Bushing" and exceptional accessibility for cleaning. The folder gives sizes, ratings and list prices.

This valve is of sturdy, rugged design and stands up well under heavy duty.

Internal Combustion Engines, bulletin S-500-B13, Worthington Pump and Machinery Corporation. A new 36-page, profusely illustrated booklet setting forth the installation of gas and diesel engines made by Worthington during the past 40 years to a total capacity of over a million horsepower.

Worthington diesel engines are of the heavy duty type, ranging from 50 to 1500 horsepower at speeds from 225 to 600 r.p.m. The modern vertical four-cycle single-acting d rect-injection design is the result o experience in building all types o engines: horizontal and vertical, two cycle and four-cycle, single-actin and double-acting, and air-injectio and direct-injection, and is genera ly accepted as offering the highes attainable operating economy an reliability.

Worthington gas engines range i size from 30 to 1800 horsepower, an are designed to operate on natura manufactured, refinery, sewage sludge, producer or any mixture o gases. The characteristics of Worthington's vertical gas engines follow closely those of its diesel engines while the horizontal double-acting gas engines operate at speeds from 125 to 200 r.p.m. Widely used on ga compressor service, the latter are also suitable for general power requirements where gas fuel is available.

Instant Death to Any Fire, bulletin A.K. 481 of Walter Kidde and Company. This is a revised bulletin containing latest engineering and technical information on Lux carbon dioxide portable fire extinguishing equipment for use against electrical, flammable liquid and many other fire hazards in the industrial marine and aviation fields.

This four-page bulletin completely describes extinguishers (from the two-pound size up to the 100-pound wheeled extinguisher) and auxiliary equipment.

Kingsbury Propeller Shaft Bearing, a four-page, illustrated leaflet describing the new, completely independent propeller shaft bearing manufactured by the Kingsbury Machine Works Inc., which is designed to flood the bearing with oil through the action of the shaft; to allow the bearing shell to deflect slightly with the shaft; to prevent any water, dirt or grit entering the bearing along the surface of the shaft; and to prevent any oil escaping from the bearing along the shaft.

Spunyarns and Catharpins

Two Sheets and No Wind.

A rather nervous college student ose sole previous experience in ndling strangers had been a year Sundays ushering in church secur- a summer job as deck boy in the ward's department of a transpaci- liner. Just after the ship was rly under way outside the Heads, is lad was approached by an old ntleman who said that a lady was ting in the deck chair assigned to s own use.

The deck boy looked up the chair mber assigned to the O. G. and und it in possession of a rather rn-looking dowager. Taking a good ch to his trousers, or whatever a-going boys do when facing a dif- ult situation, he marched up to the L. D. and in his most usherly man- r made a low bow and said:

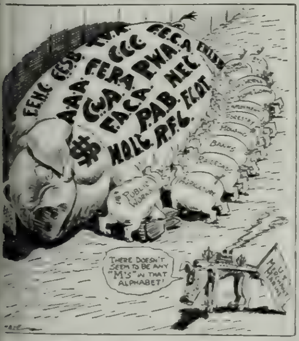
"Mardon me, padam, but you are upewing the wrong pie. Please let sew you to your own sheet."

Sparks.

A-ked to write a brief essay on the e of Benjamin Franklin, a little girl said it all in one paragraph, as follows:

"He was born in Boston, traveled to Philadelphia, met a lady on the street, she laughed at him, he married her, and discovered electricity."

The Runt!



s cartoon would be ridiculous were it not rue to the actual conditions as they affect progress of the American Merchant Marine.

A Snappy Comeback.

An Englishman and an Irishman, riding together, passed a gallows.

"Where would you be," asked the Englishman, "if the gallows had its due?"

"Riding alone, belike," replied the Irishman.

One From One Leaves Two

Higgledy Piggledy, my black hen
She lays eggs for gentlemen,
Gentlemen come every day
To count what my black hen doth lay.
If perchance she lays too many,
They fine my hen a pretty penny.
If perchance she fails to lay,
The gentlemen a bonus pay.

Mumbledy Pumbledy, my red cow,
She's co-operating now,
At first she didn't understand
That milk production must be planned;
She didn't understand at first
She either had to plan or burst
But now in Government reports
She's giving pints instead of quarts.

Fiddle-de-dee my next-door neighbors,
They are giggling at their labours,
First they plant the tiny seed,
Then they water, then they weed,
Then they hoe and prune and lop,
Then they raise a record crop,
Then they laugh their sides asunder,
And plough the whole caboodle under.

Abracadabra, thus we learn
The more you create the less you earn,
The less you earn the more you're given,
The less you lead the more you're driven,
The more destroyed, the more they feed
The more you pay, the more they need;
The more you earn, the less you keep
And now I lay me down to sleep.
—Contributed

Lobster a la Edinburgh.

A Scotsman was strolling along the quay one day, when his dog stopped beside a basketful of live lobsters. Instantly one of the lobsters snapped its claws on the dog's tail, and the surprised collie dashed off down the street, yelping with pain.

A tall four sticker on the drydock, Los Angeles Shipbuilding & Dry Dock Co.

The fishmonger for a moment was speechless with indignation; then, turning to his prospective customer, he bawled: "Mon, mon, whustle to yer dog; whustle to yer dog."

"Hoot, mon," returned the other, complacently, "whustle to yer lobster."

### Policy.

Cute—"I hear you and your sailor friend broke up."

Cutie—"Yes, he believed in the freedom of the seize."

On the Ways-

SHIPS IN THE MAKING

LATEST NEWS FROM AMERICAN SHIPYARDS

Pacific Coast Tanker Associated Launched

A new 13,000 ton, 13-knot oil tanker of ultra modern design and accommodations was launched June 9 for Tide Water Associated Oil Company at the yards of her builders, the Sun Shipbuilding and Dry Dock Company.

She was christened Associated by her sponsor, Mrs. Edward L. Shea, wife of the executive vice president of Tide Water Associated Oil Company, in the presence of a group of company officials and guests from several Eastern cities. Immediately after the launching ceremonies a reception and luncheon was held, attended by William F. Humphrey, president of Tide Water Associated, and other notables in the oil and shipping industries.

The new tanker has a length of 462 feet, a beam of 65 feet and a draft of 28 feet 4 inches. She is driven by 3600 horsepower steam turbines, and 2 water tube, high pressure main boilers of a new super heat-control type. She has a carrying capacity of 4,200,000 gallons of gasoline.

The utmost in comfort, safety and convenience has been provided for her crew of 40 men, including a lounge and recreation room fitted with easy chairs, couches, radio, card tables, games, and other attractions. The crew sleeps in staterooms, no more than two to a room. Each room has running hot and cold water, wall plug for radio and a plug beside the wash basin mirror for an electric razor. The ship is particularly well equipped in its bathing and dining facilities. Every effort has been made to turn out a ship which will be modern in crew accommodations over the estimated 20-year life of the vessel.

Navigation instruments are of thoroughly modern type and include radio direction finder, Gyro Compass, and an electric depth finding device.

The Associated sea trials took place on June 16 and the owners took delivery of the ship shortly thereafter. She then proceeded to the Tide Water Associated refinery at Bayonne to load 80,000 barrels of lubricating oils, mostly Veedol motor oil, one of the largest shipments of lubricants ever made by the company. This cargo will be delivered on the Pacific Coast for the company's business.

Thereafter the new vessel will be placed in operation on the Pacific Coast.

Bethlehem Shipbuilding Expansion

E. G. Grace, president of Bethlehem Steel Corporation, announced that Bethlehem Shipbuilding Corporation, Ltd., had, on June 2nd, purchased for approximately $9,320,000 in cash all the shipbuilding and ship repair facilities of United Shipyards, Inc., including the Staten Island Plant, located at Mariners Harbor, Staten Island, New York; the Morse Plant and the Crane Plant, in Brooklyn, New York; and the Fletcher Plant in Hoboken, New Jersey. The sale was completed following the approval of the contract by the stockholders of United Shipyards, Inc.

Bethlehem has not acquired the accounts receivable of United or assumed its outstanding liabilities, but has agreed to complete for the account of United certain work now in progress.

Bethlehem now operates shipbuilding and ship repair plants located on the East and West Coasts of the United States, including the Boston Plant at Boston, Massachusetts; the Fore River Plant at Quincy, Massachusetts; the Baltimore Plant at Baltimore, Maryland; the Sparrows Point Works at Sparrows Point, Maryland; the Potrero Works and Hunters Point Works at San Francisco, California; the Alameda Works at Alameda, California; and the San Pedro Works at Los Angeles, California. Through the acquisition of the United properties Bethlehem will be in a position to serve the large shipping interests in New York Harbor. The properties acquired from United will be known as the New York Plant of Bethlehem Shipbuilding Corporation, Ltd. The separate units of the plant will be referred to as the Staten Island Works, the Brooklyn 56th Street Works, the Brooklyn 27th Street Works and the Hoboken Works.

he shipbuilding and ship repair ness of Bethlehem is under the tion of S. W. Wakeman, vice ident, assisted by A. B. Homer, tant vice president. Arthur ebrant, formerly Assistant Man- of Sales, will be Manager of s of Bethlehem Shipbuilding oration, Ltd. The operation of New York Plant will be in ge of George H. Bates as gen- manager. The present plant per- el of United will be retained r the following Works Man- s: Charles H. Boylan at the n Island Works, John T. Wise- at the Brooklyn 56th Street ks, Walter Crane at the Brook- 27th Street Works, and George vn at the Hoboken Works.

Reconditioning Former Panama Pacific Liners

June 7, the United States Mari- Commission opened the follow- ids for the reconditioning of the s Virginia, California, and Penn- nia, which are to be placed in new service which the Commis- will establish between New York the East Coast of South America r about September 1:

thlehem Shipbuilding Corpora- of New York City.—$338,000 for one of the three ships; $685,000 ny two of the three ships.

bins Dry Dock Company of klyn, N.Y.—subsidiary of the Shipyard Corporation—$296,- for the S.S. Pennsylvania.

lantic Basin Iron Works of klyn, N.Y.—$272,001 for the S.S. ornia; $282,600 for the S.S. Vir- ; or $554,601 for both.

wport News Shipbuilding and Dock Company of Newport News, -$307,000 for the S.S. California; ,000 for the S.S. Pennsylvania; ,000 for the S.S. Virginia; $618,- for the S.S. California and the Pennsylvania; $617,000 for the California and the S.S. Virginia; ,000 for the S.S. Pennsylvania the S.S. Virginia.

e work to be performed includes ious new swimming pools for vessel; rearrangement and en- ment of cabins to increase the ort of passengers; air condition- of the dining saloons; installa-

Prospective and Actual Shipbuilding Contracts

Conditions as of June 6, 1938

U.S. MARITIME COMMISSION

Now under contract:

1 transatlantic liner (Manhattan class) for the International Merchant Marine building at Newport News Shipbuilding and Dry Dock Co. Cost $15,750,000

12 16½ knot tankers. Cost $37,556,000
- 3 to Newport News Shipbuilding and Drydock Co.
- 3 to Sun Shipbuilding and Dry Dock Co.
- 3 to Bethlehem Shipbuilding Corp.
- 3 to Federal Shipbuilding and Drydock Co.

16 15½ knot C-2 design standard cargo carriers. Cost $31,852,652
- 4 diesel drive to Tampa Shipbuilding & D.D. Co.
- 4 diesel drive to Sun Shipbuilding & D.D. Co.
- 4 steam to Federal Shipbuilding & D.D. Co.
- 4 steam to Newport News Shipbuilding & D.D. Co.

Total contracts let by Maritime Commission:
29 vessels to cost $84,958,652

Immediately pending (bids in but contract not yet awarded):
4 16½ knot cargo vessels for Export Line. Lowest bid $10,120,000

Under immediate consideration:

FOR PACIFIC COAST SERVICE:

24 vessels at a total cost of $100,000,000
Including:
- 17 fast cargo vessels.
- 4 fast combination vessels.
- 3 fast transpacific liners (improved Coolidge type).

FOR SERVICE IN ATLANTIC AND GULF SUBSIDIZED LINES:

30 vessels, 10 of which are scheduled for 1938.
Estimated cost of this 10 .... $24,000,000
Total contracts presently pending, U.S.M. Commission $134,120,000

PRIVATE PROGRAM

Now on the ways of U.S. shipyards building for private owners (without subsidy) and on private terms, includes:
- 2 large Great Lakes bulk freighters.
- 3 passenger and freight steamers.
- 16 large seagoing tankers.
- 1 large fireboat.
- 2 large ferries.

Estimated cost $42,000,000

NAVAL BUILDING PROGRAM

Under Construction:
- 27 destroyers.
- 14 submarines.
- 6 cruisers.
- 1 battleship.
- 2 airplane carriers.
- 2 tenders

and numerous tugs and small craft.

Newly authorized $1,157,000,000 Navy program to be completed in 6 to 8 years includes:
- 3 super dreadnaught battleships.
- 2 20,000 ton aircraft carriers.
- 9 10,000 ton cruisers.
- 23 destroyers.
- 9 submarines.
- 26 auxiliary vessels.

SUMMARY

Work on hand or to start in 1938:
- 67 merchant vessels.
- 55 naval vessels.

122 vessels.

Work projected the next 8 years:

Maritime Commission	455 vessels
Private (estimated tanker and general purpose)	360 vessels*
Naval	72 vessels
Other Government departments	160 vessels
Total	1047 vessels
Average per year	130 vessels

tion of a lido deck; and other new features and facilities of a modern steamship.

The vessels are now the property of the Panama Pacific Line, but negotiations for their acquisition by the Commission for the new South American service are in the final stages.

On June 13 Bethlehem Shipbuilding Corporation was awarded by the U. S. Maritime Commission a contract amounting to $685,000 for the reconditioning of the Virginia and Pennsylvania. Newport News Shipbuilding and Dry Dock Company got the contract for the California at $307,000.

Four More C-2 Standards Ordered

On June 3 the U.S. Maritime Commission awarded to the Newport News Shipbuilding and Dry Dock Company a contract aggregating $8,320,000 for the construction of four cargo steamers of the C-2 standard design.

These vessels are 435 feet long B. P., have a beam of 63 feet and a draft of 25 feet 9 inches. With 6000 shaft horsepower on a single shaft driven by double reduction gear cross compound turbines taking steam at 450 lbs. pressure from water tube boilers, they are to be capable of 15½ knot sea speed. On a displacement of 13,900 tons they carry 7200 tons of cargo and have a gross measurement estimated at 7,400 tons.

The contract calls for all four to be completed within 600 working days.

Auxiliary Machinery Manufacturer Busy

The American Engineering Company report that they have recently furnished 70 electric life boat winches, 6 electro-hydraulic steerers, 6 electro-hydraulic windlasses, 6 - 9 x 12 winches, 3 steam spur geared windlasses, 6 steam gypseys, 2 Quadrant Type steering gears, and 1 hand pump brake windlass.

In addition to the above, American Engineering Company have furnished, for installation on the M. S. Pennsylvania Sun, for the Sun Oil Company:

1 No. 12 opposed ram type electro-hydraulic steering gear;

1 No. 14 triple spur geared steam windlass;

3 8½ x 10 compound geared winches; and

2 50 H.P. electric gypseys.

Federal Launches Destroyer Ellet

Torpedo-boat destroyer DD398, christened the U.S.S. Ellet in honor of five members of the Ellet family who distinguished themselves during the Civil War, was launched on June 11 at 9:15 A.M. in the yard of the Federal Shipbuilding and Dry Dock Company, a United States Steel subsidiary.

Miss Elvira Daniel Cabell of Chicago, Illinois, sponsored the U.S.S. Ellet, named for her grandfather, Colonel Charles Ellet, Jr.; her uncle, Colonel Charles Rivers Ellet; her grand-uncle, Brigadier General Alfred W. Ellet; and her first cousins once removed, Edward C. Ellet and Lieutenant Colonel John A. Ellet.

Contracted for in 1935, the ship has a displacement of 1500 tons and is the first vessel in the United States Navy to bear this name.

Launching on June 9 at the yard of the Sun Shipbuilding and Dry Dock Company of the 13,000 ton 13 knot tanker for Pacific Coast operations of the Associated Division of the Tide Water Associated Oil Company. She was christened Associated by Mrs. Edward L. Shea, wife of the executive vice president of Tide Water Associated. A full description of this launching appears on Page 42.

Dependable
Insurance
Since 1863

Fire · Automobile · Marine · Casualty · Fidelity · Surety

FIREMAN'S FUND GROUP
Fireman's Fund Insurance Company — Occidental Insurance Company
Home Fire & Marine Insurance Company
Fireman's Fund Indemnity Company — Occidental Indemnity Company

New York · Chicago · SAN FRANCISCO · Boston · Atlanta

Strength
Permanence
Stability

A Generation of American Yachting

tablished as an experiment in , Lloyd's Register of American ts, in its 36th year, covers the age span of years which is rec- zed as a generation, and it is in- sting to look back at conditions ey existed in yachting at the be- ing of the century.

e names of owners and yachts e original list of subscribers go ack into the history of American ting, while the yachts, whether powered or auxiliary, were all m propelled, representing the l efforts of the designers, British American, of the fin-de-siecle od, almost the end of the reign team. Among other subscribers such well known men as W. E. n, John B. Herreshoff, James B. , John Hyslop, R. W. Emmons, is Cass Ledyard, E. M. Padelford, herford Stuyvesant, and A. Cary th.

he total number of pages in 1903 450 with 42 flag plates, includ- the burgees of 92 yacht clubs and private signals of 1078 owners, the particulars of 92 clubs. The ht list, then divided into "steam power" and "sail," included 850 hts in the first category and 1939 he latter. The Register of today udes 728 pages, with 66 flag es, 634 club burgees, and 2997 ate signals. The total number of s and associations listed is 706 yachts 6589, with the addition of new craft. As the division be- en power and sail is no longer maintained, it is not possible to give the number of each division, but it is safe to say that, apart from the smaller racing yachts, there are very few of any size which rely solely on sail.

As to power, steam has entirely disappeared, the diesel engine taking its place in the larger craft. The gasoline engine, almost in its infancy in 1903, has increased vastly in number, in power and in efficiency, for the present at least leading its rival, the diesel engine. While the full-powered cruising yacht has increased greatly in numbers, and while there are still a few whose tonnage exceeds 1,000 tons, the average of the larger yachts is nearer 500 tons. Below this are many hundreds of able and capable cruising craft down to a limit of 10 to 15 tons. In the full-powered sailing craft the gasoline engine and, to a lesser degree, the diesel, is in general use as an indispensable auxiliary, even in craft designed for long-distance races under sail. In addition to the real auxiliary, there is a rapidly growing class of intermediates, known roughly as "motor-sailers" or "50-50", full-powered launches with the addition of a fairly effective rig.

One notable feature of the new book is the growth of the ocean racing yacht, largely under the stimulus of the new rule of the Cruising Club of America; a type found in many sizes and designed for races, both coastwise and transatlantic, on the open sea. While there is comparatively little activity in the building of large sailing yachts for racing, there is a great increase in the numerous smaller racing classes, open and one-design, and especially in those designed for the junior contingent, now so conspicuously to the fore in all parts of the country.

The book, which was published at the end of May, was in the usual blue and gold binding at $14.00, and the yacht canvas at $12.00. The Flag Plates may also be had separately at $3.00. Apart from that reference for specific information which is the prime use of the book, it will repay a careful examination as a measure of the present condition and the future outlook of American yachting.

Radio and Safety at Sea

In inviting attention to the great strides made regarding safety at sea, particularly since the World War, an article in the Shipping World of April 6, published in London, contains a table showing sharp reductions in the average of vessels lost as well as the loss of lives of passengers per year from the year 1904 to 1937, in which period the average of vessels lost was reduced from 86 to 38 and the passengers and crew from 406 to 44. It is further pointed out in the quoted article that this progress is

Marine Insurance in All Phases — "All Risks" . . . Inland Marine . . . Ocean Marine
STANDARD MARINE INSURANCE COMPANY, LIMITED
NATIONAL UNION FIRE INSURANCE COMPANY
MERCANTILE INSURANCE COMPANY OF AMERICA
GEO. E. BILLINGS CO.
Pacific Coast General Agents—Richard J. Lutich, Marine Manager
GArfield 3646
308 California St.
SAN FRANCISCO
TRinity 1521
Spreckels Bldg.
LOS ANGELES
SEneca 1478
Colman Bldg.
SEATTLE

MARINE DEPARTMENT
AETNA INSURANCE CO.
QUEEN INSURANCE CO.
MARITIME INSURANCE CO., LTD.
FIDELITY PHENIX FIRE INS. CO.
Commercial Hull Dept.
AUTOMOBILE INS. CO.
Mathews & Livingston
Marine Underwriters
200 BUSH ST. SAN FRANCISCO
Offices at: Colman Bldg. - Seattle 111 West 7th St. - Los Angeles

due to a number of reasons, but "perhaps the most of all to the development of wireless" and further that "The great development of the direction finder which enables a ship to grope its way in fog and the gradual increase in the numbers of wireless beacons on shore had further added to safety. It was satisfactory that many of the light vessels which were not being gradually replaced would, in future, be fitted with radio-beacons." It is further stated in regard to the necessity of fully protecting the radio frequencies now used for such purposes as radio direction finding as follows: "It is most essential that the wireless wave bands used by the maritime services shall not be encroached upon by other services. . . . Much as one appreciates the need for continuous development of broadcasting it is of the first importance that we put safety of life at sea before any other consideration, and that due regard is paid to the essential services which shipping renders to mankind."

The necessity of jealously guarding the narrow band of frequency available for the operation of radiobeacons, 284 to 315 kilocycles, has long been appreciated in the United States, particularly by the Lighthouse Service, which has been forced to develop a complete system comprising more than 130 such radiobeacons and to operate them without interference in this narrow band. It seems evident even with the utmost protection available that it may be necessary in the further development of the use of radio aids for auxiliary navigational purposes, to go to other frequency bands in order to be able to operate them without detriment to the existing primary system. The above quoted views as to the giving of first importance to furthering the safety of life at sea by resistance to encroachment on these wave bands cannot be too strongly endorsed.

—Lighthouse Service Bulletin.

Early Lighthouse Building

An employee of the Service has forwarded to the Bureau an interesting newspaper clipping of August 6, 1807, which contains an advertisement by the Treasury Department for bids to cover the construction of a lighthouse on Fayerweather Island (Black Rock Light Station, now abandoned) in the State of Connecticut. In addition to the interest attaching to this newspaper notice because of its age, the subject matter is interesting in that the complete specifications for the lighthouse were made a part of the advertisement so that in the language of the advertisement all that remained was compliance with the following: "Persons disposed to contract will be pleased to forward their terms to Jedediah Huntington, Esq., Collector of the Customs at New London, on or before the 15th day of September next, who will immediately thereafter transmit them to the Treasury Department, from whence notice will be given of the accepted offer."

The same clipping includes the following item from a New York paper of August 31, 1807, illustrative of the slow means of communication prevailing in those times as compared with the present day: "By the ship Cato, Captain Coit, arrived here yesterday in 40 days, from Hull, the editors of the New York Gazette have received London papers to the 12th July, containing the important intelligence that after several successful and bloody battles, Bonaparte had compelled the Russians to ask for an armistice. Previous to agreeing to an armistice, Konigsberg, Memel, etc., surrendered to the French arms."

- Lighthouse Service Bulletin

Observations From The Crow's Nest

"NAMES AND NEWS" ★ BERNARD DeROCHIE, LOOK-OUT MAN

Pope and Talbot

Effective June 4, Pope & Talbot mber Co. took over all the proper- s of Chas. R. McCormick Lumber ., with timber and lumber mills in ashington and Oregon.

The new company's announcement ated that under the name of its incipal owners the organization ll carry on the service and tradi- ons of 85 years of manufacturing d distributing Douglas fir lumber d products. The staff of the new mpany is the same as that of the rmer organization, with the follow- g officers:

George A. Pope, chairman.

George A. Pope, Jr., president.

Charles L. Wheeler, executive vice- esident.

J. A. Lunny, vice-president.

Hillman Lueddemann, vice-presi- nt.

Jas. S. Brown, secretary-treasurer.

Pope & Talbot history in the lum- r business begins way back in 1767, hen they shipped a cargo of Am- ican lumber into Boston harbor om East Machias, Maine. The Popes d Talbots were among the first ttlers of East Machias.

The development of the organiza- on turned West in 1850 when Cap- in William C. Talbot arrived in n Francisco with a cargo of lum- r. He was preceded by other mem- rs of the families. In 1853 Captain lbot visited Puget Sound in search more timber and directed the erec- on of the Port Gamble lumber mill, hich is still in operation, although nsiderably improved and enlarged nce that time.

McCormick Steamship Company, erating 30 ships in domestic and reign routes, and formerly a sub- diary of Chas. R. McCormick Lum- r Co., is now owned directly by the pe & Talbot interests.

● Bon Geaslin

Appointment of **Bon Geaslin** as General Counsel of the United States Maritime Commission, is announced by Emory S. Land, Chairman.

Mr. Geaslin, who joined the Commission's legal staff in May, 1937, has been Acting General Counsel since February 17, when Max O'Rell Truitt, the former General Counsel, was appointed a member of the Commission. He is a native of Missouri and a graduate of National University Law School in Washington. Prior to 1926, when he came to Washington as secretary to Senator Harry B. Hawes, he practiced law in Kennett, Missouri. In 1933 he became a member of the Hawes law firm, from which he came to the Commission's staff.

● George M. Jeffrey

This ought to be labeled a success story, the "home-town boy makes good" angle, for it has to do with **George M. Jeffrey,** 33, who in ten years time has climbed from bell hop on a transpacific liner to the envied position of chief steward on one of the finest of Matson Line ships. But George declined to reveal any specific secret that may be credited with his swift advancement.

"The usual thing is to say 'hard work,' isn't it?" he asked. Perhaps he's right, for his record shows both the opportunity for that work, and the chance to have dropped out of the running had he so desired.

It was ten years ago that he joined the Matson Line as bell hop aboard the old Malolo. Next we find him as swimming pool attendant; then library steward, soda fountain attendant and deck steward. Another transfer established him as yeoman, then bartender, and up to third steward, still on the same ship.

Later transfers gave him service on the Monterey when she was first out of shipyards, then placed him as chief steward on two of the company freighters. Moved back to the passenger fleet, he headed the Lurline's cabin steward staff, serving for a time also as second steward, until final promotion gave him the position of chief steward aboard the Monterey, effective with the last sailing.

One of the most popular men in the fleet, he has been receiving the congratulations of co-workers and shoreside acquaintances alike.

● Capt. Vance D. Trout

Following the resignation of Hector H. Hunt, the post of president of the Coastwise Line was taken over by **Capt. Vance D. Trout,** formerly connected with States Steamship Company. Headquarters of the new president will be in Seattle.

Capt. Trout was at one time master of ships operated by the Columbia Pacific Line, which was later taken over by States Line, at which time he became marine superintendent at Portland. He was subsequently stationed at San Francisco as port captain for International Mercantile Marine Company.

● Carl Strout

Effective on June 15, **Carl Strout,** one of the most widely known shipping men on the Coast, took over the duties of general manager of the Alaska Transportation Company at Seattle. He began his career in 1908 as office boy to H. F. Alexander, president of the Pacific Steamship Company, and worked his way to the post of operating manager. Since the discontinuance of that company's coastwise service, Mr. Strout has been at the terminals in Seattle. W. J. Jones continues with the Alaska Transportation Company as general traffic manager.

Operating Appointment by Matson

- **Capt. James P. Rasmussen**

Recalled by many veterans of the A. E. F. as the executive officer of the Matson liner Maui, which served as a troop transport during the World War, **Capt. James P. Rasmussen** has been made assistant to the operating manager, Hugh Gallagher, of Matson Navigation Co., it was announced recently. He was awarded a medal for valor in rescuing a man washed overboard in mid-Atlantic.

For the past eighteen years Capt. Rasmussen has been port captain for the line at Honolulu. He entered Matson service in 1906 as a quartermaster and was promoted captain in 1919 on the old Lurline, predecessor of the present luxury liner of that name. Before returning to California, probably in August, Capt. Rasmussen will make a survey of all Hawaiian Island ports, Pago Pago, Suva, Auckland, Sydney and Melbourne.

New Manager, Grace in L. A.

- **David N. Lillevand**

On June 15 **David N. Lillevand** was promoted manager of the Grace Line in Los Angeles, according to word received here. He became connected with Grace Line in 1919 in Seattle as clerk in the freight department, later being named chief clerk in charge of passengers and freight traffic. In 1924 came the promotion to operating manager for Grace and Johnson Line vessels in the Pacific Northwest territory.

Then in 1934 he was transferred to Los Angeles as manager of operations for Grace and Johnson Line services, where he continued until withdrawal of the "Santa" ships from the intercoastal service, when he was given the post of terminal superintendent at San Francisco, leaving there to take over his present duties.

Bendix Appoints

Announcement has been made by Bendix management of new personnel appointments in operating staffs, in line with the recently announced decentralization program and new policy and plans of the corporation.

Victor W. Kliesrath, vice president and a director of Bendix Aviation Corporation, formerly head of the engineering staff of the automotive division, and vice-president and general manager of the Bendix Products Corporation at South Bend, will head up a new marine development division, with headquarters at New York. He will act also in the capacity of consulting engineer in other fields of activity of the corporation.

Malcolm P. Ferguson is made vice-president and general manager of Bendix Products Corporation.

John P. Mahoney is made vice-president in Charge of Industrial Relations of Bendix Products Corporation.

Herbert L. Sharlock, vice-president, Director of Publicity of Bendix Products Corporation, is advanced to Director of Public Relations of Bendix Aviation Corporation.

The development of the marine division of the industry offers great possibilities which the management has felt should not be overlooked. In addition to the recent production in its South Bend plant of its successful line of outboard motors, remote controls, etc., it manufactures in its Eastern plants automatic steerers, autosyn motors, ship's controls, ship's telegraphs, intercommunicating telephones, alarm signals, water and depth testing devices, marine radio systems and equipment, and many other important marine devices. Mr. Kliesrath is particularly qualified in the promotion of this marine division, not only by engineering ability and experience, but by his natural tendency toward marine activities. He is a winner of the Gold Cup Race, the President's Cup Race, and other important marine racing events. He is a Commodore of the Circuit Riders, and is a Lieutenant Commander of the U.S. Naval Reserves.

Necrology

- **Henry W. Poett**

After an association of long duration with Williams, Dimond & Co., **Henry W. Poett** passed away in Los Angeles during the early part of June at the age of 66. He entered the company when he was 16 years old, starting in a minor capacity and steadily rising to the presidency. Owing to ill health. Mr. Poett had not been active during the past year.

- **Passing of Popular Sales Manager**

Edgar White Wagenseil, sales manager of Hagan Corporation, and a resident of Oakmont, Pittsburgh, died suddenly on May 10 while engaged in his official duties. He was 54 years old.

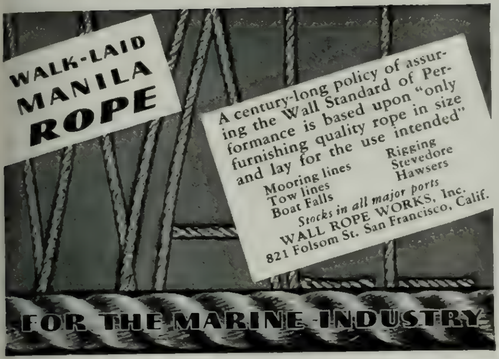
Mr. Wagenseil was born at Port Huron, Michigan, in 1884. He was graduated from the University of Illinois in 1905, and was first employed by Illinois Steel Company as steam engineer at their South Works plant.

He was later associated with the Chicago Smoke Abatement Commission and with the Burke Furnace Company, manufacturers of furnaces and stokers.

During the World War Mr. Wagenseil was an officer in the Aviation Division of the U.S. Navy Department. Following the war he was connected successively with the Harrington Stoker Company, Westinghouse Company, and Blaw-Knox, where he was engaged for five years in selling pre-heaters in the steel industry.

For the past six years Mr. Wagenseil has been general sales manager of Hagan Corporation and its subsidiaries, The Buromin Company and Hall Laboratories, Inc. His success was widely known and his friendship will be missed by scores throughout the steel industry and in the power field.

He also enjoyed many friendships as a member of the American Society of Mechanical Engineers, the Engineers' Society of Western Pennsylvania, and the Pittsburgh Field Club.



WALK-LAID MANILA ROPE

A century-long policy of assuring the Wall Standard of Performance is based upon "only furnishing quality rope in size and lay for the use intended"

Mooring lines
Tow lines
Boat Falls

Rigging
Stevedore
Hawsers

Stocks in all major ports

WALL ROPE WORKS, Inc.
821 Folsom St. San Francisco, Calif.

FOR THE MARINE INDUSTRY

Your Home IN PORTLAND
Hotel MULTNOMAH
600 OUTSIDE ROOMS • SENSIBLE RATES

Personal

Edward T. Ford, Vice-President and Director of W. R. Grace & Co., announces the appointment of **Harold R. Kelley** as Manager with headquarters at No. 2 Pine Street, San Francisco, effective June 20th.

Kelley has a very long and successful record with the Company. After attending Georgetown University, Kelley joined the service of W. R. Grace and Co. in New York in February, 1899. In 1903, he was transferred to Peru, where he eventually became sub-manager of Lima House. He returned to New York in 1916 and at present holds the position of manager in New York.

For a great many years he has been associated very closely with Pacific Coast affairs and among his duties in New York he supervised the sales of Pacific Coast products in the Eastern markets.

In Peru, he was very successful in building up business in exports from the Pacific Coast, particularly in lumber, box shooks, flour, salmon and other canned goods.

The present Executive Personnel on the Pacific Coast will remain exactly as at present.

For the Marine Field . . .

WORTHINGTON

PUMPING EQUIPMENT

REFRIGERATION EQUIPMENT

AIR CONDITIONING EQUIPMENT

AIR COMPRESSORS

STEAM CONDENSERS

FEEDWATER HEATERS

STEAM-JET EJECTORS

DIESEL ENGINES

STEAM TURBINES

. . . The product of unsurpassed engineering and rigid quality standards

●

WORTHINGTON offers a consulting service based on seventy-five years of successful experience in the solution of marine pumping and power problems.

World-wide service . . . branch offices and representatives in all principal cities

WORTHINGTON PUMP AND MACHINERY CORPORATION
General Offices: HARRISON, NEW JERSEY

CO7-16

Propeller Club of California Closes First Semester of '38

A capacity attendance that taxed the cubic contents of the club's luncheon meeting place turned out to do homage to the past presidents of the Propeller Club of California on Tuesday, June 7.

Wielding the gavel for the event was Fletcher Monson, who introduced with eclat the former skippers of our good craft. In chronological order the several administrations were reviewed in high lighted fashion, and responding to these presentations were Joe Dolan, Jim Cronin, Ralph Myers, Tom Hunter, Harry Haviside, Charley Robertson and Ed Harms. Joe Geary telegraphed from Washington, D.C., so the roster was completely represented.

Harry Haviside introduced at the June 7 meeting the famous old shipmaster Captain Henry Townsend, who was aboard for the event.

Recent new members include John Pruner, purchasing agent of American-Hawaiian, and Oscar Beyfuss, San Francisco ship broker. Welcome, gentlemen!

Joe Coney is back from an Eastern trip armed with excellent photos which he staged around the St. Lawrence country.

Vacation time is here for the club and meetings will be resumed during September, with the big Fall Golf Tournament as a headliner.

Captain A. F. Pillsbury has returned from a round trip aboard the China Clipper. Business lured him to the Islands, and the captain took to the air over the sea lane which he has traveled so frequently as a ship's master.

Warren Taylor.

Warren Taylor Returns from Eastern Tr

Warren Taylor, Pacific Coast fa
tory representative of the Wall Ro
Works, Inc., recently visited the co
pany's headquarters in New Yo
and the Wall factory in Beverly, N
Jersey. He returned to San Francis
in the middle of June and repo
widespread interest in all quarte
over the new American shipbuildi
program under the guidance of t
U.S. Maritime Commission. Mr. Ta
lor is continually on the go up a
down the Pacific Coast territo
working closely with his compan
sales representatives in leadi
ports.

Bilge Club Ruckus

The Bilge Club had its Ninth Annual Barbecue and Tournament of Golf, Tennis and Baseball at Palos Verdes Golf Club, Palos Verdes Estates, California, Saturday, June 25, 1938.

The committee for the event consisted of:

Billy Wickersham, Honorary General Chairman.

Art Pegg, General Chairman.

Dan Dobler, Asst. General Chairman.

Chris Christensen, Chairman, Tennis.

Art Woll, Chairman, Publicity.

Al Johnson, Chairman, Prize Committee.

Ed Hannay, Chairman, Handicap.

Tom Forster, Chairman, Reception.

George Sutherland, Chairman, Grounds.

J. W. Lang,, Chairman, Attendance.

C. I. Houghton, Chairman, Rules.

Ed Whittemore, Chairman, Baseball.

Jack Malseed, Chairman, Tournament.

Walter Richards, Chairman, Barbecue.

Life Boat Races

The International Lifeboat Race of 1938, to determine the champion lifeboat crew of the world's merchant marine, will be held Saturday afternoon, September 10, over a two mile course in the Narrows off Bay Ridge, Brooklyn, it was recently decided at a meeting on board the Queen of Bermuda at Pier 97, North River. The International Lifeboat Race is an annual event held in New York Harbor since 1927 for the advancement of safety of life at sea.

The 1938 race, in which a number of liners representing several nationalities pledged participation, will be rowed with standard United States Coast Guard lifeboats, it was decided.

The present world champions of lifeboat racing are a lifeboat crew of the S.S. Conte di Savoia. I. E. Verrando, general manager of the Italian Line in the United States, pledged that the Italian contenders would be in this year's race to defend their title.

The meeting was under the direction of the newly elected president of the International Lifeboat Racing Association, Inc., E. P. Rees, Gene
Manager of Furness, Withy & Co.

The following were voted memb
of the Racing Rules and Regulatio
Committee: Captain C. C. Baldw
chairman; Captain W. H. Lee, Ca
tain William Drechsel, Captain H.
McDougall, John Sirignano, Capta
S. Christensen, Captain L. Le Fria
Captain H. A. Cunningham, and Ca
tain Marcus Hegmann.

Among those attending were: J.
McGrath, Magistrate M. J. Troy,
ward P. Mulrooney, Ira A. Campb
Frank J. Taylor, Captain H. Gra
R. F. Hand, Captain H. A. Cunni
ham, Commander J. S. Baylis,
mander A. G. Hall, Commander
ter Jones, and Captain T. H. Moll
all of the Coast Guard; and Capta
Joseph Schleideler of the Marin
vision of the New York Polic
partment.

Running Lights
of Pacific Shipping

J EPH A. LUNNY

ice-president and director of op- ons, McCormick Steamship Com- pa.

orn, educated in San Francisco . the waterfront his favorite haunt as lad. Started lumber-shipping er with Oliver Olson firm in 19. Joined the Marines in wartime. his lot with McCormick in '18 on at Pier 7. His 20 years include s as terminal agent in Wilming- assistant operating manager, op- ng manager to present executive n '35.

e Lunny has been of inestimable in solving shipowners' common lems . . . his ideas progressive. bies . . . golf and his family; a , a daughter just entering her s, a 7-year-old Joe, Junior.

EDWIN J. MACFARLAN

Export department, Standard Oil of California. Affectionately known to his San Francisco buddies (and their name is legion) as Eddie. Born here, and has worked for over thirty years for this big organization exclusively. His department's responsibility brings him into direct contact with shipping circles—dispatching sales carried by the 28-tanker fleet. Plenty of baseball in his youth. Sandlotted with these diamond notables: Ping Bodie, Babe Pinnelli, Harry Krause. You guessed it! He was a shortstop and a honey. Plays some golf . . . likes to swim. Lives in the Marina and there's a Mrs. and a son. Past president of Export Managers Club. Vice-president of Foreign Trade Association. Headed banquet committee, last month's big party. A colonel for several years in Community Chest.

WILLIAM H. SELLANDER

Passenger Traffic Manager, Matson Navigation Company. His birthplace, Benicia, Calif. Our "youngest pioneer"—he started with Captain William Matson as private secretary . . . his duties were varied along with the Captain's "adventures" in sailing ships, oil, pineapples . . . In those early days "all one family." The Matson ships carried limited numbers of passengers. With the arrival of the Enterprise the passenger business began in earnest . . . and W.H.S. was placed in charge. Ardent gardener and indulges his hobby in the Claremont hills of Berkeley. The Sellander iris is famous. An officer in the Alameda Garden Club. Chairman of the Committee which built . . . and now a director of—the Army and Navy "Y" on the Embarcadero. Member of Kiwanis. There's a wife and daughter.

Rebuilding Our Merchant Fleet

(Continued from Page 19)

ments and to charter these vessels to the established steamship lines.

The foreign trading lines should be allowed to plan for their own use the types, sizes, and speeds of vessels which they as commercial operators know are required to meet the competition faced by their own services. Shipbuilding subsidies as liberal as can be granted under the law should be paid on this construction, and ship operating subsidies should be applied to the legal limit which is absolute parity with the lowest cost competitor at the time of application.

All American citizens should bear in mind certain facts about the financial assistance which the Merchant Marine Act of 1936 provides for the American merchant marine. These are clearly stated by Chairman Land in the closure of his remarks to the U. S. Chamber of Commerce:

"Government financial assistance for the merchant marine rehabilitation program is to be obtained through direct subsidies—a construction subsidy and an operating subsidy. These subsidies are designed solely to place the American steamship operator on a parity with his foreign competitors by equalizing the increased prices which he must pay for ships built in American yards, and the higher cost of operating his vessels under the American flag. The American manufacturer and American farmer is placed on the same basis by the tariff.

"'The impression has been created that the Act provides munificent subsidies for shipbuilders. That is erroneous. The shipbuilder does not get a cent from the Government in the way of financial assistance. The Government merely pays the difference up to 50 per cent of the total between what it would cost to construct a ship abroad and what it costs to build it in an American shipyard. This is to the advantage of the operator, not the builder.

"The operating subsidy works in similar fashion, the Government paying the difference between the foreign and domestic cost of operation as represented by such items as wages, maintenance, repairs and subsistence, in order that the American steamship operator can meet his foreign flag competitor on an equal footing.

"By far the greatest percentage both of these subsidies—constructic and operation—goes directly and i directly to American labor. That part of the price of our America standards of labor and our America standards of living.

"At the same time these subsidi represent an investment in nation security."

Webb Graduates Ten

On Thursday, June 2, that unique school, the Webb Institute of Naval Architecture, at New York, held its forty-second annual commencement exercises and presented diplomas to ten budding marine architects.

This institute, founded by William H. Webb (in many respects America's greatest shipbuilder in the days of the Clippers and during the transition period from sail to steam), admits students only on a basis of merit; has an excellent faculty; fosters a fine specialized library; owns a very valuable and well improved property in New York City; is heavily endowed; and is able to give its students a thorough training in naval architecture and marine engineering at very little pecuniary cost to the student.

The graduates receiving diplomas on June 2 were:

John DuBois Pierson
Howard Millard Hardy
James R. Lilienthal
John Sylvester Garwood
Chester B. Maciejewski
William S. Henry
Elvin M. Schelin
H. Smith McKann
William Lyle Blake
Robert Steele, Jr.

Rear Admiral George H. Rock has charge of administration, and the faculty is composed of Professor W. Selkirk Owen, Naval Architecture; Associate Professor Thomas M. Curran, Naval Architecture; Professor Lyman J. Ballard, Engineering; Professor Jeremy B. Blood, Marine Engineering; Professor Benjamin C. Keeler, Mathematics; Professor John P. Simmons, Chemistry; Professor George E. Haefner, English and Economics; Mrs. Phyllis C. Blood, l brarian.

Webb Institute is managed by board of trustees. The members ar officers of the present board are:

Lewis Nixon, President; J. Bar tow Smull, Vice President; Samu D. McCoomb, Vice President; Willia Young, Secretary-Treasurer; Jam A. Farrell, Homer L. Ferguson, Howland Gardner, Fred A. Goetze, L. Hague, M. G. Kindlund, Cliffo D. Mallory, Harry A. Marvel, P. McAuliffe, S. D. McComb, J. Lew Luckenbach, Lewis Nixon, Joseph Powell, George H. Rock, Thomas Rowland, Jr., J. Barstow Smull, Wi liam Young.

Nordberg Diesels

(Continued from Page 23)

ing of variable speed reversible m tor combined with suitable redu tion gearing arranged to mesh wi teeth on the flywheel rim. The tur ing gears may be readily engag or disengaged and are interlock with the engine starting controls.

Starting air will be supplied two motor driven starting air co pressors, each of 90 C.F.M. free a capacity compressing up to 500 lb per square inch pressure. Two sta ing air receivers will be furnish for each ship, having sufficient pacity for 12 starts of the two ma engines plus 25 per cent extra cap city for starting ship's diesel gene ating units and for ship's air servic

Pacific Paint & Varnish Co.

Synthex Red Lead Primer (Q. D.)
" Anti-Corrosive
" Anti-Fouling
" White Enamel-Non-Bilge (O.S. & I.S.)
" Cabin Enamels (Q. D.)
" Mast Colors, Hull Black
" Boottopping, etc.

Synthex Marine Spar Varnishes and Yacht White Enamel

Aluminum Enamel

Flat White (Inside & Outside)

A specialized finish for each paintable surface.

Pacific Marine Finishes have been used successfully for years by most of the important steamship companies. Each represents a specially developed product for a specific purpose. Quality—not price—is the objective of our Research Department.

L. M. DuCOMMUN
President

San Francisco and Berkeley

A. B. ROBERTSON
Vice President

SWAYNE & HOYT, Ltd.

SHIPOWNERS and AGENTS
215 Market Street - San Francisco, California, U.S.A.

GULF PACIFIC LINE
(Between Gulf Ports and Pacific Coast)

CALMAR LINE
(Between North Atlantic and Pacific Coast)

YAMASHITA LINE
(Far East—New York—South America)

OFFICES:
Seattle - Portland - San Francisco - Oakland - Los Angeles - Chicago - St. Louis - Cincinnati - New York
New Orleans - Mobile - Birmingham - Houston

The most potent bulwark ever raised against scale and corrosion in the battle for efficient and economical marine boiler operation—

The HALL MARK signals victory for shipowners thus protected!

Today 227 vessels have eliminated mechanical boiler cleaning expense because their owners realize the value of the HALL SYSTEM OF BOILER WATER CONDITIONING.

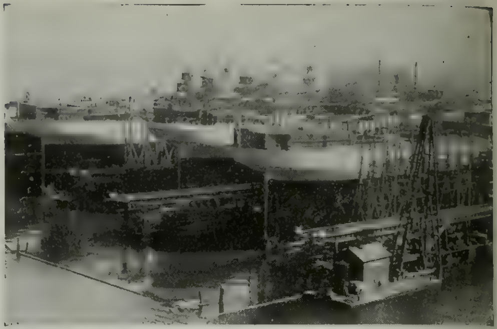
The Hall Laboratories has earned the confidence and respect of every shipowner it is serving.

Bull & Roberts
117 Liberty Street
New York

Hall Laboratories, Inc.
981 Folsom Street
Phone GArfield 7027
San Francisco

Hagan Corporation
Bowman Building
Pittsburgh, Pa.

Building in American Yards



Pacific Coast

BETHLEHEM SHIPBUILDING CORPORATION, LTD.

(Union Plant)
San Francisco

NEW CONSTRUCTION: **Hull 5355—McCall (DD400).** Launched November 20, 1937; completion date March 1, 1938; **delivered June 15, 1938.**

Hull 5356 — Maury (DD401); launched February 14, 1938; completion date about August 15, 1938. Two 1500-ton destroyers for U. S. Navy; length, 341′ 3⅝″; beam, 35′ 6⅛″; depth, 19′ 8″. Cost $3,675,000.

DRYDOCK AND ROUTINE REPAIRS: **Bahrein, Charcas, Shell Oil Barge No. 1, Knud Rasmussen, Stm. Sch. Bandon, Stm. Sch. Whitney Olson, District of Columbia, President Pierce, Munami, K. R. Kingsbury, Alvarado, President Polk, Vitus Bering, Mauna Ala, Wairuna, Manukai, Peter Lassen, Santa Maria, U.S.C.G.C. Shawnee, Antietam, M.S. Trondanger, Heffron, Oliver Olson, Reliance, Bonham.**

FELLOWS & STEWART, INC.

Wilmington, Calif.

NEW CONSTRUCTION: **Contract No. 671, 37 foot auxiliary Marconi sloop. Completion date about July 15, 1938.**

Contract No. 672, 75 foot overall Class "X" sloop. Completion date about October 1, 1938.

DRYDOCK AND ROUTINE REPAIRS: **Yachts Navigator, Dwyn Wen, Hermana, Amorilla and Joyita; Sea Sport, Westernspirit and Norconian III; 59 smaller sail and motor yachts and fishing boats.**

GENERAL ENGINEERING & DRY DOCK CO.

Foot of Fifth Avenue
Oakland, Calif.

DRYDOCK AND ROUTINE REPAIRS: **Makua, Noyo, Tennessean, Barbara C., Tahoe, Paul Shoup, Gas. S. Golden State, Sch. Wm. H. Smith, Sch. Louise, Helen Whittier, L.H.T. Lupine, Utahan, Kanak, W. R. Chamberlin, Jr., Mana, Coast Shipper.**

HARBOR BOAT BUILDING CO.

Berth 264, Fish Harbor
Terminal Island, Calif.

DRYDOCK AND ROUTINE REPAIRS: **New Limited, City of San Pedro, Salvage Tug Retriever.**

HONOLULU IRON WORKS

Honolulu, T. H.

DRYDOCK AND ROUTINE REPAIRS: **Dickenson, Point Vincente, Steel Mariner, President Harrison, Kamchatneft.**

LAKE WASHINGTON SHIPYARDS

Houghton, Wash.

DRYDOCK AND ROUTINE REPAIRS: **North Pacific.**

LOS ANGELES SHIPBUILDING & DRY DOCK CORP.

Los Angeles Harbor
San Pedro, Calif.

DRYDOCK AND ROUTINE REPAIRS: **M. V. Romulus, Sch. Lottie Carson, Catalina, Huguenot, Los Angeles, Mojave, Yt. Haida, M.V. Silvermaple, Emidio, Pat Doheny, M. V. Tooya, Greystoke Castle, M.V. Kollgrim, Walter A. Luckenbach.**

MARE ISLAND NAVY YARD

Mare Island, Calif.

NEW CONSTRUCTION:

Sturgeon, Submarine (SS187); keel laid October 27, 1936; launching date March 15, 1938; estimated delivery September, 1938.

Swordfish, Submarine (SS193); keel laid October 27, 1937; estimated delivery date August 1, 1939.

Order received for construction of two harbor tugs, YT 133 and YT 134, October 7, 1937.

Order received for construction of garbage lighter (YG21), dated February 8, 1938.

DRYDOCK AND ROUTINE REPAIRS: **Quincy, Reuben James, Goff, Clark, Dorsey, Elliot, Relief, Bridge, Sonoma, Pike, Shark, Eagle No. 32.**

THE MOORE DRY DOCK CO.

Oakland, Calif.

NEW CONSTRUCTION: **Hull No. 192, bay and river freighter** for Bay and River Navigation Company. Length molded 182′ 11½″, breadth molded 40′ 0″, depth molded 10′ 0″; twin screw; powered by Union diesel engines of 275 H.P. each. Contract date February 15, 1938; keel laid May 4, 1938.

DRYDOCK AND ROUTINE REPAIRS: **Frances, Santacruzcement, S. C. T. Dodd, Emidio, Santa Fe Barge No. 5, Delawarean, Dorothy Wintermote, San Bernardino, Maunawili, Shawnee, District of Columbia, H. T. Harper, Winona, Arizonan, Curaca, F. J. Luckenbach, M.S. Canada, Silverteak, Kailua, Delta Standard, Yacht Zaca, W. S. Rheem, Oregonian, Mathew Luckenbach, Barge Maltha, Lake Frances, Sea Queen, Blue Water, Sobre Los Olas, El Capitan, Madrono, American Star, Silverpalm, Californian, Patterson, Tacoma, Etolin, Bering, Iowan, Glacier, G. C. Brovig, Pennsylvanian.**

THE PUGET SOUND NAVY YARD

Bremerton, Washington

NEW CONSTRUCTION:

U.S.S. Wilson (Destroyer No. 408); standard displacement, 1500 tons; keel laid March 22, 1937.

U.S.S. Charles F. Hughes (Destroyer No. 428); standard displacement 1600 tons; order placed by Navy Department December 7, 1937.

DRYDOCK AND ROUTINE REPAIRS: **Colorado, Idaho, Mississippi, Arizona, San Francisco, Heather.**

TODD SEATTLE DRY DOCKS, INC.

Harbor Island
Seattle, Wash.

DRYDOCK AND ROUTINE REPAIRS: **Aberdeen, Moran, Unimak, Horace Luckenbach, Barge Santiago, M.S. Northwind, General W. C. Gorgas, Tug Commissioner, Olympic, Diamond Cement, North Sea, Charcas.**

WESTERN BOAT BUILDING CO., INC.

2505 East 11th Street
Tacoma, Wash.

NEW CONSTRUCTION:

Hull No. 131, purse seine fishing boat, 78′x20′x9′; 200 H.P. Atlas engine; launching date May 1, 1938.

Hull No. 132, 50′ pick-up fishing boat for New England Fish Company. Keel laid March 12, 1938.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE CO.

Pittsburgh, Pa.

NEW CONSTRUCTION: **Three cargo barges** 132′ x 35′ x 10′ for Campbell Transportation Co., Pittsburgh, Pa. **Delivery dates May, 1938 to September, 1938.**

903 FIFE BLDG.
1 DRUMM ST.

THOMAS A. SHORT

Successor to

C. V. LANE

Marine Representative:
Thos. A. Short,
1 Drumm Street, San Francisco

HYDE STEERING GEARS
HYDE WINCHES
HYDE WINDLASSES
HYDE CAPSTANS
HYDE MANGANESE BRONZE PROPELLERS & CASTINGS
A. B. SANDS & SON CO., PLUMBING FIXTURES
SMOLENSKY NOISELESS CHECK VALVES
BACHARACH INDUSTRIAL INSTRUMENT COMPANY
DIEHL MFG. CO. FANS, MOTORS, GENERATORS
SUBMARINE SIGNAL COMPANY FATHOMETER
COLORED CRAYONS
METAL WORKERS' CRAYONS
WELIN QUADRANT AND SHEATH SCREW DAVITS
MACLACHLAN GRAVITY DAVITS
LIFEBOAT WINCHES
METALLIC LIFEBOATS AND LIFERAFTS
SHORT OIL SEPARATOR
WILLIAM W. NUGENT & CO., OIL FILTERS
U. S. METALLIC PACKING
CONSOL RUST REMOVER
CONSOL RED and BLACK
HASKELITE—PHEMALOID
PLYMETL ORNAMENTAL PANELS
B. F. GOODRICH CUTLESS RUBBER BEARINGS
MEEHANITE CASTINGS—PISTON RING STOCK, BURNER CONES, ETC.
R. P. ADAMS POROUS FILTERS
SHORT OIL DETECTING SERVICE FOR PROTECTING BOILER FEED WATER AND FUEL OIL HEATERS

Hyde Windlass Company

Steering Gears, Windlasses, Capstans, Bronze Propellers —as installed on America's finest ships.

Bath, Maine

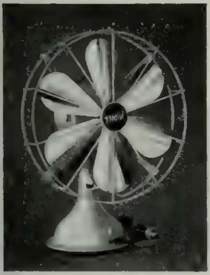
Pacific Coast Representative:
Thos. A. Short, 1 Drumm Street, San Francisco

Inter-Coastal Paint Corporation

SAN LEANDRO, CALIFORNIA

Originators and sole manufacturers of CONSOL both plain and in colors. A conditioning solution for metal surfaces that have become corroded. Not only a scale remover but a preservative as well. Gives excellent results when applied to boottop belt, hull, holds, bilges, tank tops, chain lockers, ventilator trunks, decks and so forth. Is non-inflammable and contains no acids or chemicals that are injurious to men or metal.

Marine Representative
Thos. A. Short, 1 Drumm Street, San Francisco

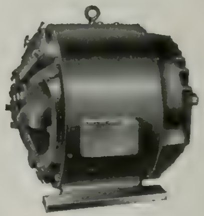


Marine Motors, Generators and Ventilating Equipment

DIEHL MANUFACTURING COMPANY

Electrical Division of
THE SINGER MANUFACTURING CO.
Elizabethport, New Jersey

San Francisco Representatives:
MARINE ELECTRIC CO.
Desk and Wall Fans
THOMAS A. SHORT
Motors, Generators, etc.



BIRD-ARCHER CO. of Calif., Inc.

BOILER WATER TREATMENT

Specialists in Marine Feed Water Problems

We have successfully treated and serviced the boilers of every new high pressure steamer built for Pacific Coast operation in recent years.

"SERVICE BACKED BY EXPERIENCE"

Seattle
Portland

19 FREMONT STREET, SAN FRANCISCO

Wilmington
Honolulu

Agents for "BACITE" Cold Set Cement for the insulation of living quarters aboard ship.

THE AMERICAN SHIP BUILDING COMPANY

Cleveland, Ohio

NEW CONSTRUCTION: **Two bulk lake freighters** 610′ x 60′ x 32′ 6″; 2,000 I.H.P. geared turbine, water tube boilers, 400 lbs. pressure, electric auxiliaries; for Pittsburgh Steamship Company. Keels laid June 21, 1937; and July 6, 1937; launching dates November 10 and December 2, 1937; **delivered June 6 and June 20, 1938.**

BATH IRON WORKS

Bath, Maine

NEW CONSTRUCTION: Hulls Nos. 161, 162, and 163; **DD394 Sampson, DD395 Davis and DD396 Jouett; Three 1850-ton destroyers for U.S. Navy; date of contract September 19, 1935.** Keels laid, No. 163, March 26, 1936; No. 162, July 28, 1936; No. 161, April 8, 1936; No. 161 launching date April 16, 1938; others indefinite; **estimated delivery dates June,** August and October, 1938, respectively.

Hulls Nos. 170-171, DD409, Sims, and DD410, Hughes, two 1500-ton destroyers for U. S. Navy; contract date October 12, 1936; keels laid July 15 and September 15, 1937, respectively; launching dates, indefinite; delivery dates April, 1939, and June, 1939, respectively.

Hulls Nos. 177 and 178, DD423 and DD424, two 1620 ton destroyers for U. S. Navy. Contract date September 30, 1937; delivery dates April and June, 1940, respectively.

BETHLEHEM SHIPBUILDING CORPORATION

Fore River Plant,

Quincy, Mass.

NEW CONSTRUCTION:

CV7, Wasp, Airplane Carrier for U.S. Government; keel laid April 1, 1936; estimated launching date November, 1938.

Hulls Nos. 1467, 1468, 1469, three passenger and freight steamers for Panama Railroad S.S. Co.; 486 feet x 64 feet x 38 feet 6 inches; 16½ knot speed. Keels laid Nos. 1467 and 1468, October 25, 1937; No. 1469, November 15, 1937; estimated launching dates October and December, 1938, and February, 1939.

Hulls Nos. 1470 and 1471, two 1500 ton destroyers for U. S. Government; delivery dates March, 1940 and May, 1940.

Hulls Nos. 1472 and 1473, two diesel powered trawlers 147′0″ overall, 128′9″ perps., 27′0″ beam, 14′4″ depth.

BETHLEHEM SHIPBUILDING CORPORATION

Sparrows Point Plant

Sparrows Point, Md.

NEW CONSTRUCTION:

Four 13,000 deadweight ton steam turbine driven tankers for Standard Oil Co. of N. J.; length 442′, beam 64′, depth 34′ 10″, gross tonnage 7,600, speed 12 knots. Esso Baton Rouge launched November 13, 1937. R. W. Gallagher launched January 22, 1938.

One tanker for Texas Co.; about 13,000 deadweight tons; steam turbine.

Hull No. 4334; one 13,000 dwt. oil tanker for Union Oil Co. of Calif. Contract signed March, 1938.

Hulls Nos. 4329, 4330, 4331; three 16,300 dwt. ton tankers for Standard Oil Co. of N. J.; 18 knots speed. Contract signed January 3, 1938.

Hulls Nos. 4332 and 4333; two 16,000 dwt. tankers for Socony Vacuum Oil Co. Contract signed February, 1938.

BETHLEHEM SHIPBUILDING CORPORATION

Staten Island Works

Staten Island, N.Y.

NEW CONSTRUCTION:

Hull No. 856, fireboat for City of New York. Length O.A. 134′ 0″, breadth 32′0″, depth 13′3″. Keel laid April 19, 1938; **estimated launching date July 14, 1938;** estimated delivery date August 25, 1938.

BOSTON NAVY YARD

Boston, Mass.

NEW CONSTRUCTION:

DD402, Mayrant, and DD403, Trippe, two light destroyers for United States Navy; LBP 334′; beam 35′6″; depth 19′ 8″; keels laid April 15, 1937; launched May 14, 1938; estimated delivery dates October, 1939, and November, 1939, respectively.

DD415, O'Brien, and DD416, Walke, two destroyers; LBP 341′, beam 36′, depth 19′8″; keel laying date **June 1, 1938;** delivery date 1940.

DD425, Madison, and DD426, Lansdale, two destroyers; 341′0″ x 36′0″ x 19′8″. Keel laying date December 1, 1938; launching date November 1, 1939; delivery date 1940.

One harbor tug for U. S. Navy; 98′0″ LBP x 24′0″ x 13′6″; keel laid March 28, 1938; **launched June 9, 1938;** completion date September 15, 1938.

BROOKLYN NAVY YARD

Brooklyn, N.Y.

NEW CONSTRUCTION:

CL 48, **Honolulu,** light cruiser; L.B.P. 600′; beam 61′8″; standard displacement 10.000; geared turbine engines; express type boilers; keel laid September 10, 1935; launched August 26, 1937; estimated delivery, August 1, 1938.

CL 50, **Helena,** light cruiser; L.B.P. 600′; beam 61′7¾″; standard displacement 10,000; geared turbine engines; express type boilers; keel laid December 9, 1936; estimated launching date January 9, 1939; estimated delivery January 2, 1940.

BB 55, **North Carolina,** battleship; L.B.P. 714′ 0″; beam to outside armor 108′ 0″; std. displ. 35,000 tons; geared turbine engines; express type boilers. Keel laid October 27, 1937; estimated launching date May 1, 1940; contract delivery September 1, 1941.

CHARLESTON, S. C., NAVY YARD

Charleston, S.C.

NEW CONSTRUCTION:

Order placed for **one harbor tug;** LOA 124′ 9″, length between perpendiculars 117′, breadth, molded, 28′, depth, molded, 16′; **keel laid August 2,** 1937; launched March 7, 1938.

Order placed for **one harbor tug;** LOA 110′ 3″; LBP 98′ 0″; breadth 24′ 0″; depth at side amidships 13′ 6″. No dates set.

Order placed for one **harbor tug;** 65 feet long.

DEFOE BOAT & MOTOR WORKS

Bay City, Mich.

NEW CONSTRUCTION:

Two diesel electric towboats 94′x25′; steel construction; powered by 1000 S.H.P. General Motors engines. For General Motor Sales Corp. **Delivery date July, 1938.**

Hulls Nos. 72 and 73; two diesel electric harbor cutters for Coast Guard; 110′x26′6″; powered by 1000 S.H.P. General Motors engines; steel construction. Delivery date April, 1939.

One diesel yacht 49′ 6″ x 11′ 6″ for A. J. Fisher, Detroit, Mich. Powered by 300 S.H.P. Gray conversion of General Motors engines; wood construction. **Delivered June 1, 1938.**

THE DRAVO CORPORATION

Engineering Works Division

Pittsburgh, Pa., and Wilmington, Del.

NEW CONSTRUCTION:

Hull No. 1452; one welded steel oil barge 195′ x 35′ x 9′6″, for stock; 489 gross tons.

Hulls Nos. 1455-1456; two welded steel coal barges for stock; 1346 gross tons.

Hulls Nos. 1457-1461; five welded cargo barges 280′ x 47′ x 11′, for Inland Waterways Corp., 7220 gross tons.

Hulls Nos. 1462-1465; four welded cargo box barges 100′ x 26′ x 6′6″ for stock; 660 gross tons.

Hulls Nos. 1466-1475; ten welded W-4 coal barges 175′ x 26′ x 10′ 8″ for stock; 4720 gross tons.

Hull No. 1476; one welded steel coal barge 126′ x 34′ x 17′ for M. & J. Tracy, Inc.; 673 gross tons.

This makes a total of 23 hulls with a total gross tonnage of 15,108 tons.

ELECTRIC BOAT CORP.

Groton, Conn.

NEW CONSTRUCTION:

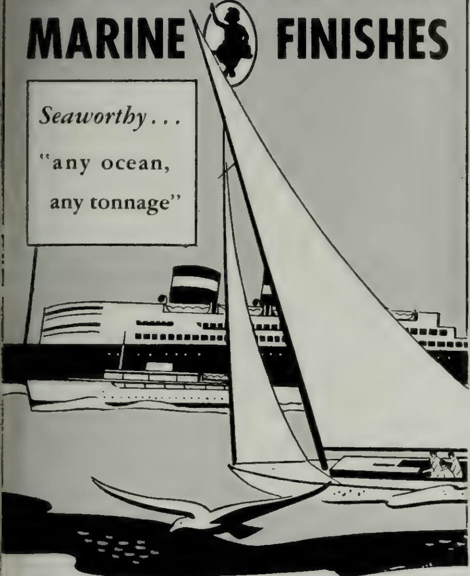
Hull No. 28, Skipjack, SS184, standard displacement, 1450 tons; **keel laid** July 22, 1936; launching date October 23, 1937; **delivered July, 1938.**

Hull No. 29, Sargo (SS188); standard displacement 1450 tons; keel laid May 12, 1937; **launching date June 6, 1938;** delivery date February, 1939.

Hull No. 30, Saury (SS189); standard displacement 1450 tons; keel laid June 28, 1937; launching date August 29, 1938; delivery date April, 1939.

Hull No. 31, Spearfish (SS190); standard displacement 1450 tons; keel laying date September 9, 1937, launch-

BASS-HUETER
MARINE FINISHES



Seaworthy...
"any ocean,
any tonnage"

ASK THE NATIONAL LEAD MAN!

NEW ZEALAND - AUSTRALIA VIA SAMOA - FIJI

Are you planning a vacation of activity or of leisure? Whatever your formula, there is no place where you can give it effect more perfectly than in Hawaii. Frequent sailings.

Hotel reservations at Royal Hawaiian or Moana at Waikiki are made at the same time as steamer bookings.

FARES:*(each way) California to Honolulu*
FIRST CLASS *from* **$125** **CABIN CLASS** *from* **$85**

Matson South Pacific Cruises every 4 weeks to New Zealand, Australia. *Personally-escorted.* 48 days. All-inclusive-cost, First Class, from $650 *for certain Summer sailings.*

SHIPPERS: The *Lurline* and *Matsonia* provide swift freight service to Hawaii. The *Mariposa* and *Monterey* continue to New Zealand, Australia. Modern refrigeration facilities. *Also frequent freighter service from Pacific Coast ports.*

Details from Travel Agents or: **MATSON LINE - OCEANIC LINE**
San Francisco - Los Angeles - Seattle - San Diego - Portland
S. S. LURLINE **S. S. MARIPOSA** **S. S. MONTEREY** **S. S. MATSONIA**

FRANCE

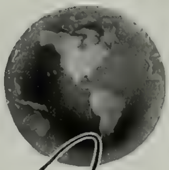
TRADE MARK

"Thirty-Nine Years Satisfactory Performance"

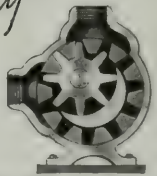
Manufactured exclusively by

FRANCE PACKING COMPANY
Main Office and Factory
TACONY, PHILADELPHIA

Represented by
SAN FRANCISCO—HERCULES EQUIPMENT & RUBBER CO.
550 - 3rd Street—EXbrook 2575
SEATTLE—GUY M. THOMPSON
1241 Railroad Ave., South—Phone MAin 1870
PORTLAND—E. B. HUSTON
127 S. W. First Ave.—Phone ATwater 6754



There is a reason why shrewd pump buyers all over the world, have specified 700,000 Viking Rotary Pumps.



Write For The Special Bulletin That Will Tell You Why

VIKING PUMP CO. CEDAR FALLS IOWA
2038 S. Santa Fe Avenue, Los Angeles, Calif.
Pacific Coast Distributors
DeLaval Pacific Co., 61 Beale St., San Francisco, Calif.

ing date October 29, 1938; delivery date June, 1939.

Hull No. 33, Seadragon (SS194); 1450 tons; keel laying date April 18, 1938; delivery date December, 1939.

Hull No. 34, Sealion (SS195); 1450 tons; keel laying date June 15, 1938; delivery date February 1940.

THE FEDERAL SHIPBUILDING AND DRYDOCK COMPANY
Kearny, N. J.

NEW CONSTRUCTION:

Three destroyers, **DD397 Benham, DD398 Ellet and DD399 Lang,** 1500 dis. tons; **launching dates April 16, June 11,** and August 1938; keels laid DD397, September 1, 1936; DD398, December 3, 1936; DD399, April 5, 1937.

Two destroyers, DD411 Anderson and DD412 Hammann; keels laid November 15, 1937 and January 17, 1938, respectively.

Hulls Nos. 149, Pan - New York, and 150, two 12,900 ton tankers for Pan American Petroleum and Transport Co.;; 440′ B.P. x 66′6″ x 34′ 6″, 450′ OA.; Isherwood Arcform design of hull form and longitudinal hull framing. Keels laid November 15, 1937 and January 10, 1938 respectively; **launching dates May 14 and July, 1938;** estimated completion date October, 1938.

Hulls Nos. 151, 152, and 153, three tankers for Standard Oil Co. of New Jersey.

Hulls Nos. 154, 155, 156 and 157, four C-2 cargo vessels for U. S. Maritime Commission.

INGALLS IRON WORKS CO.
Birmingham, Ala.

NEW CONSTRUCTION: **One 15-ton derrick boat hull** for U.S.E.D.; **launched June 1, 1938.**

Two diesel dredge tenders 63′ x 15′ 6″ x 6′3″ for U. S. Engineer Office, Memphis, Tenn. Launching date about September 10, 1938.

Ten hopper type cargo barges 280′ x 48′ x 11′ for Inland Waterways Corp. **Launching dates June to October, 1938.**

JAKOBSON & PETERSON, INC.
Brooklyn, N.Y.

NEW CONSTRUCTION:

Hull No. 274, 84 foot all welded steel tug.

Hull No. 275, 70 foot auxiliary yawl.

Hull No. 276, 86 foot all welded steel tug.

LEVINGSTON SHIPBUILDING CO.
Orange, Texas

NEW CONSTRUCTION:

One all welded petroleum barge 92′ x 27′ x 6′ for Cenac Towing Co., Houma, La. **Delivered June, 1938.**

One all welded petroleum barge 92′ x 27′ x 6′ for stock.

MANITOWOC SHIP BUILDING CO.,
Manitowoc, Wis.

NEW CONSTRUCTION: **One tanker** for Socony-Vacuum Oil Company, Inc., New York; 290′x49′ 6″x20′ 6″; 23,600 barrels capacity; 1500 H.P. twin screw diesel. **Launched June 9, 1938;** delivery date August, 1938.

THE MARYLAND DRYDOCK CO.
A Subsidiary of Koppers Company,
Baltimore, Maryland

DRYDOCK AND ROUTINE REPAIRS: **Franklin K. Lane, Charles R. McCormick, E. J. Bullock.**

THE NEW YORK SHIPBUILDING CORPORATION
Camden, N. J.

NEW CONSTRUCTION:

Two light cruisers, Hull No. 413, Nashville (CL43), and **Hull No. 416 Phoenix (CL46)** of 10,000 tons each for the U.S. Navy Department; keels laid, 1935; **No. 413** launched October 2, 1937; **No. 416** launched March 12, 1938.

One destroyer tender for U. S. Navy; order placed December 27, 1937.

One seaplane tender for U. S. Navy; order placed December 27, 1937.

NEWPORT NEWS SHIPBUILDING & DRYDOCK CO.
90 Broad Street, New York

NEW CONSTRUCTION:

H361, light cruiser, CL47, Boise, keel laid April 1, 1935; launched, December 3, 1936; **delivery date July, 1938.**

H362, light cruiser CL49, St. Louis: keel laid December 10, 1936; launched April 15, 1938; delivery date April, 1939.

Hulls Nos. 363-364, two destroyers, Nos. 413, Mustin, and 414 Russell; keels laid December, 1937; delivery dates June and August, 1939.

Hull No. 369, twin screw mail, passenger and cargo liner for United States Lines Co.; length 723′, beam 92′, depth 45′.

Hulls Nos. 370, 371 and 372, three oil tankers for Standard Oil Company of New Jersey; gross tonnage about 11,500 tons; L.B.P. 525′; breadth molded 75′; depth molded 39′.

PHILADELPHIA NAVY YARD
Philadelphia, Pa.

NEW CONSTRUCTION:

Order placed for **DD404,** 1500 ton destroyer; no dates set.

PORTSMOUTH N. H., NAVY YARD
Portsmouth, N. H.

NEW CONSTRUCTION:

SS186 Stingray, submarine; keel laid October 1, 1936; L.B.P. 300′, beam 26′, loaded draft 15′7″; launched October 6, 1937; commissioned March 15, 1938; **completed June 1, 1938.**

Also building here, four more submarines, Sculpin, Squalus, Searaven and Seawolf.

THE PUSEY & JONES CORP.
Wilmington, Del.

NEW CONSTRUCTION:

Two single screw, steel freight steamers for the Philadelphia and Norfolk Steamship Co., Philadelphia, Pa. L. O. A. 292′, L.B.P. 280′, beam 48′6″, depth 32′ 3″, draft 18′; geared turbine drive 4000 S. H. P.; 2 water tube boilers. Launched April 14, 1938.

Hull No. 1070, one steel hoppe dredge, Chester Harding; 2,500 cubi yard capacity; length overall 308′2′ length B.P. 300′0″, breadth molded 5 0″, depth molded 29′0″. Contract dat February 14, 1938; keel laid May 15 1938; delivery May, 1939.

SUN SHIPBUILDING AND DRY DOC COMPANY
Chester, Pa.

NEW CONSTRUCTION:

Hull No. 168, One diesel tanker fo stock account, equipped with Sun Doxford engine; 542′5″ x 70′ x 40′ 18,360 D.W.T. Keel laid August 19 1937; **launched May 20, 1938; delivered June 15, 1938.**

Hull No. 169, one oil tanker (steam) 520′ x 70′ x 40′; for Atlantic Refinin Co.; 18,500 tons; keel laying date November 30, 1937; **launching date Jul 23, 1938;** delivery date, August 6, 1938

Hull No. 171, one single screw stea tanker for Tide Water Associated Oi Co.; 462′ 4″ x 65′ x 35′; 12,900 dwt. keel laid November 9, 1937; **launche June 9, 1938; delivered June 18, 1938.**

Hulls Nos. 172, 173 and 174, thre tankers for Standard Oil Co. of Ne Jersey; steam turbine; 525′ x 75′ x 39′ 16,300 dwt. Keel laying dates April 18 May 31, and August 1, 1938; delivery dates, February 1, April 11, and Ma 15, 1939.

Veneer Sheets of Large Siz

The Meyercord Compound Lumbe Company has gone into productio at Mobile, Alabama, producing veneers in sizes up to 6 feet by 10 feet This increased size has been mad practical for commercial purposes owing to the improved methods o drying the sheets at only 130 degrees Fahrenheit, in a specially designed drying kiln. The process eliminates acids and salts that caus case hardening, hence checks an split pieces have been practicall eliminated, and waviness, inheren in ordinary veneers, has been materially reduced.

As a result, there is far less wast for the plywood manufacturer, enabling him to proluce panels tha are more economical to handle at a price that compares favorably wit resinous Western veneers.

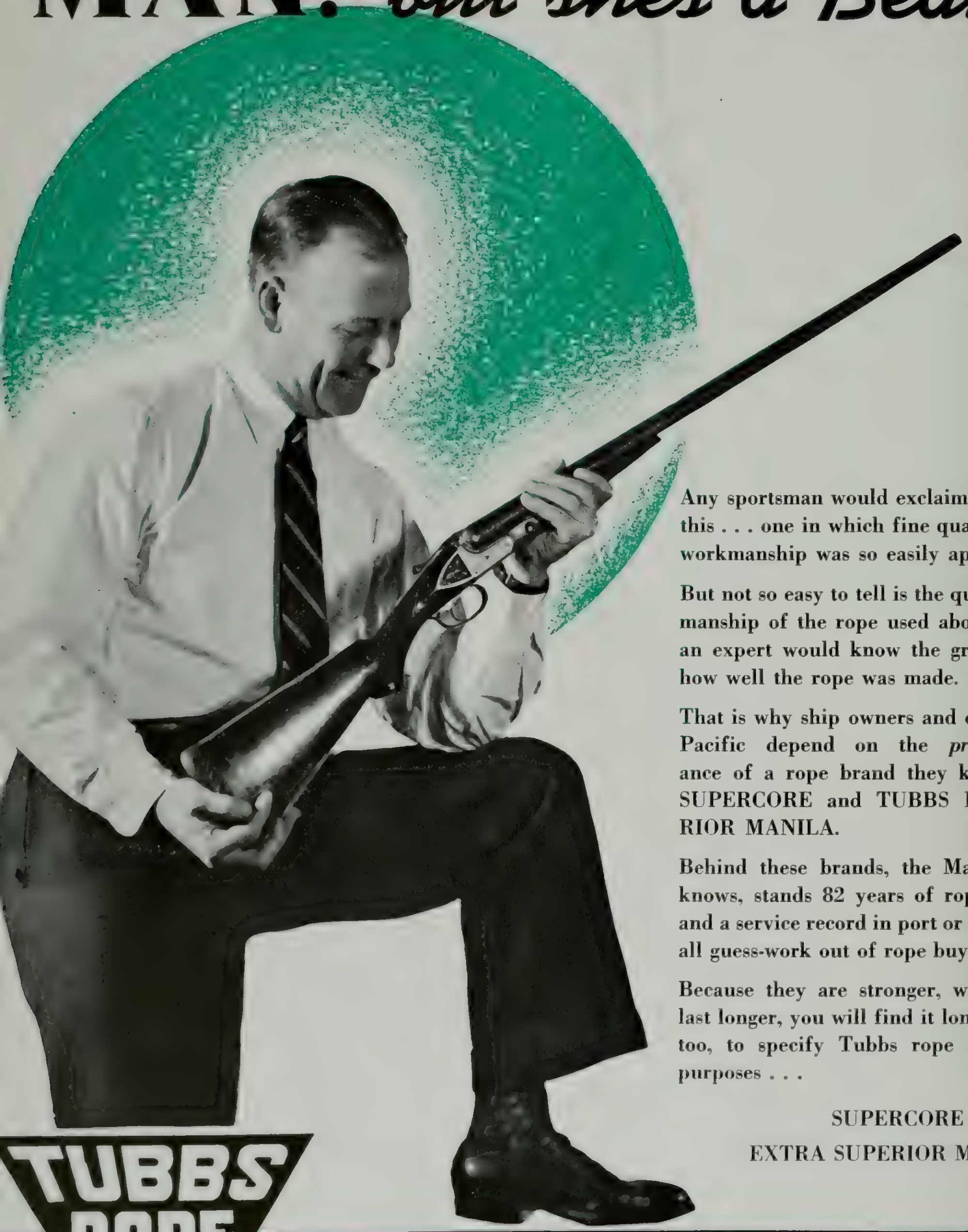
At present the veneers produce are largely Southern hard woods.

It is anticipated that the locatio of the mill at tide water will enabl the Meyercord Compound Lumbe Company to draw additional log from Central and South America, these forests are developed.

PACIFIC MARINE REVIEW

AUGUST
938

The New Tanker S S Associated



MAN! *but she's a Beauty*

Any sportsman would exclaim over a gun li this . . . one in which fine quality and care workmanship was so easily apparent.

But not so easy to tell is the quality and wor manship of the rope used aboard ship. On an expert would know the grade of fibre how well the rope was made.

That is why ship owners and operators of t Pacific depend on the *proven* perfor ance of a rope brand they know — TUB SUPERCORE and TUBBS EXTRA SUP RIOR MANILA.

Behind these brands, the Marine rope us knows, stands 82 years of rope making sk and a service record in port or at sea that tak all guess-work out of rope buying.

Because they are stronger, wear better, a last longer, you will find it long-run econon too, to specify Tubbs rope for all Mari purposes . . .

SUPERCORE

EXTRA SUPERIOR MANILA

TUBBS ROPE

TUBBS *Cordage Company*

200 Bush Street, San Francisco

Mills in San Francisco

Last Minute Flashes from Washington

The United States Maritime Commission re-ived two bids for the charter, for a period of ree years, of the government-owned American epublics Line and its fleet of 13 vessels including e three passenger liners, California, Pennsylva-a and Virginia, which will inaugurate the new press service between New York and the East oast of South America in September.

Bidders were C. H. Sprague & Son, Inc. of Bos-n, the firm which now operates the American epublics Line as the managing agent for the Com-ission, and Moore & McCormack Company, Inc. New York City.

For charter as of September 1 C. H. Sprague & n submitted a bid of $16,970 per month for all vessels, based on $4000 per month for each liner d $4970 a month for all the 10 cargo ships.

Moore & McCormack Company, Inc. submitted bids for charter as of January 1, 1939, on four fferent bases as follows:

1. Charter of the entire fleet at $36,600 per onth.

2. Charter of the three express liners at $18,600 month.

3. Charter of the three express liners at $18,600 month, use of six of its own cargo vessels and if dditional cargo vessels are required charter of one to four vessels at $1800 a month for each vessel.

4. Charter of the three liners at $18,600 per month, use of six of its own cargo vessels, and, if additional vessels are required in the service, purchase outright one to four vessels at $60,000 apiece.

The United States Maritime Commission awarded to the Bethlehem Shipbuilding Corporation, Ltd. of Quincy, Mass., contract for the construction of four cargo vessels at an approximate cost of $2,559.000 each for the account of the American Export Lines and for use in their Mediterranean and Black Sea service.

This award fulfills one of the requirements under the new subsidy agreement whereby the American Export Lines agreed to construct 10 new ships during the period of the next five years, of which four were to be on the ways before the end of this year.

The vessels are a standard design developed by the American Export Lines and approved by the Commission. 475 feet long, with a displacement of 14,450 tons, their speed will be 16½ knots, and they will be single screw propelled by high pressure cross compound double reduction geared turbines with a normal rating of 8000 s.h.p. on 96 r.p.m. of the propeller shaft. Boilers and turbines will be in one compartment amidships.

PACIFIC MARINE REVIEW

AUGUST 1938

Official Organ

acific American
teamship Association

ipowners Association
f the Pacific Coast

CONTENTS

Editorial Comment:

Pacific Coast Shipbuilding 17

"Let's Start Rebuilding Our Merchant Marine in 1938" 18
American Merchant Marine Institute.

Associated—First of the Modern Steam Tankers for the Tide Water Associated Oil Company 20

Your Problems Answered 36
By "The Chief."

Steady as You Go 39
For the Deck Officers.

Spunyarns and Catharpins 41

An Unusual Shallow Draft Sternwheel Towboat 42

Genco's New Plate Shop 44

On the Ways 46
Latest News from American Shipyards.

Marine Insurance:

Emergency Loudspeaker Systems 48A
By F. C. Hoelzle.

Recent Changes of Masters 48B

Running Lights of Pacific Shipping 49

Names and News 50

Building in American Yards 54

Miscellaneous:

Literature of the Industry, 38; Engineers' Licenses, 38;
March of Time Features Coast Guard, 43; Deck Officers' Licenses, 58.

Our Frontispiece

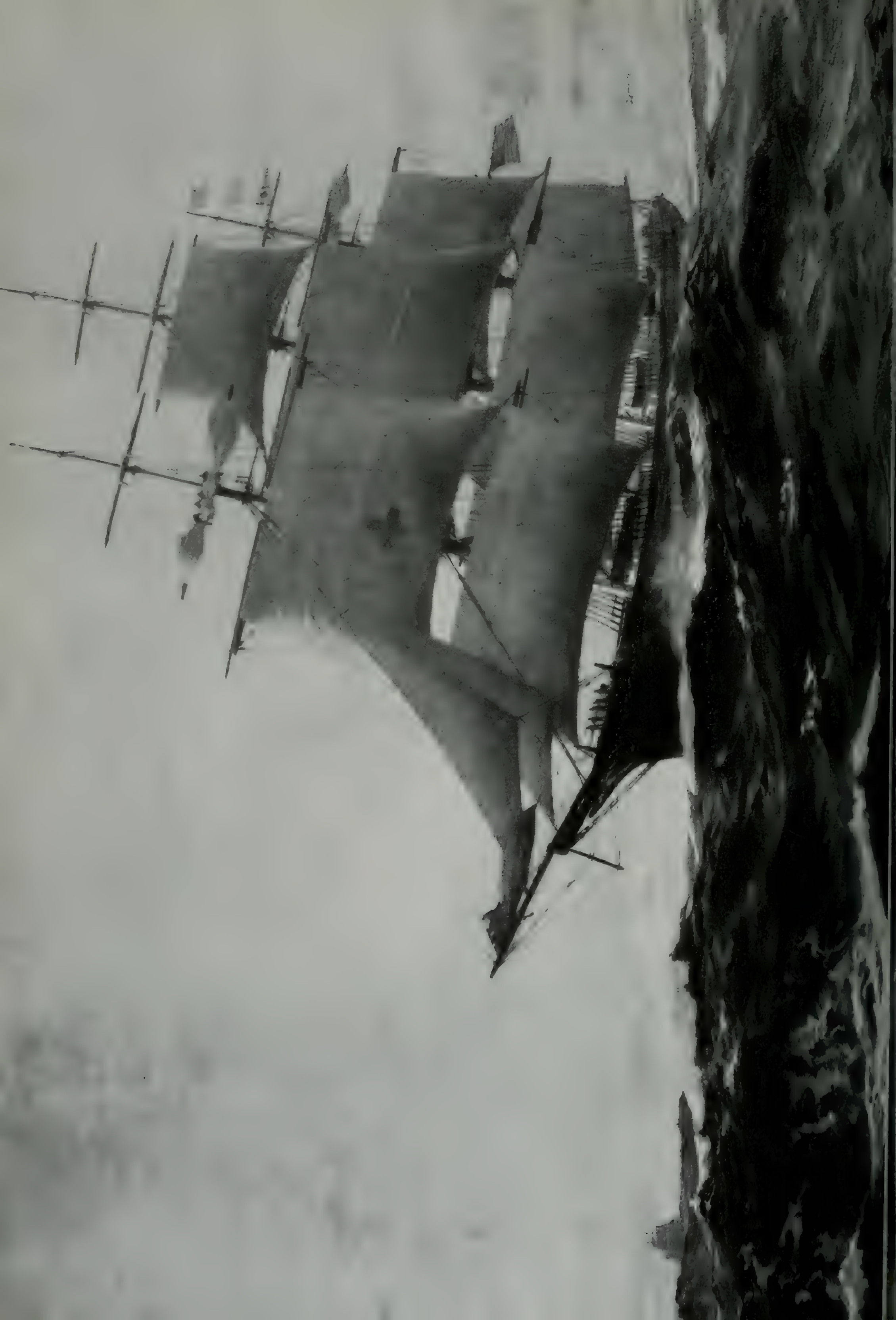
Our frontispiece this month is reproduction of Charles R. atterson's spirited painting of he famous American packet hip Dreadnaught, which caried passengers and mail across he Atlantic in the '40s and 50s of last century. She frequently made better time than he steamers of those days and as a great favorite among nowing travelers.

PUBLISHED AT 500 SANSOME STREET . . . . SAN FRANCISCO

d as second class matter June 20, 1913, at the post office, San Francisco, under the Act of March 3, 1879. Published on the 1st of each . Advertising and editorial forms close on the 15th. Subscription price, one year: Domestic, $1.50; foreign, $2.50; two years: Domestic, foreign, $4.00; three years: Domestic, $3.00; foreign, $5.50; single copies, 25c. Chas. F. A. Mann, Northwest Representative, 1110 Sound Bank Bldg., Tacoma, Washington. New York Office, Suite 404-405-406, Two Hundred Broadway, Telephone COrdlandt 7-3579.

w York City copies of Pacific Marine Review can be purchased at the news stands of I. Goldberg, 42 Broadway; Harry Nash, 17 Battery Philip Mandara, Greenwich Street and Battery Place. In Washington, D. C., at the news stand of the Carlton Hotel, 16th and K Streets.

J. S. Hines	**B. N. DeRochie**	**Alexander J. Dickie**	**Paul Faulkner**	**F. Dryden Moore**
ent and Publisher	Assistant Publisher	Editor	Advertising Manager	Assistant Editor



PACIFIC MARINE REVIEW

VOLUME XXXV AUGUST 1938 NUMBER 8

Pacific Coast Shipping and Shipbuilding

The present picture of American flag transpacific and Pacific Coastwise shipping gives the impression of confusion and perplexity both ashore and afloat. Pacific Coastwise passenger shipping is practically out of the picture. American flag transpacific shipping is limited to one line and that has only a 30-day extension of life under its present management. The chairman of the U. S. Maritime Commission has stated that the problem is a "tough nut to crack" and that it has the Commission badly "puzzled." All of this, as published daily in the press, is causing much discouragement and creating a very black and dismal picture of the Pacific American shipping situation.

However, there is one factor which is working now throughout the Pacific States —a factor which is in large part due to the very blackness of this picture — a factor which more than any other is needed to eliminate the confusion and bring light and life to American flag shipping on the Pacific.

This favorable factor is the realization by Pacific Coast citizens that American flag shipping on the Pacific is a very potent agent in boosting the sales of Pacific Coast products, and for increasing the trade of Pacific Coast ports.

With this factor actively at work, as is shown by the cooperative activities of citizen bodies in all Pacific Coast trade centers, we may confidently look forward to a renewal of normal conditions in Pacific American shipping.

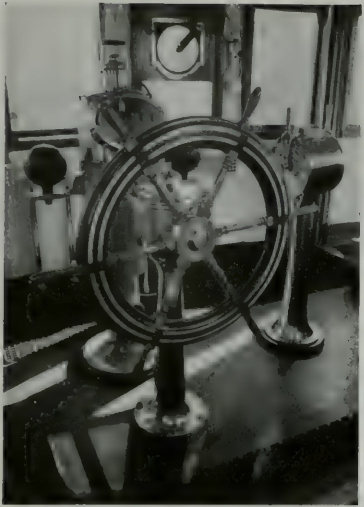
Meanwhile all this is bringing the Pacific Coast closer to a revival of steel shipbuilding and the existing shipyards are getting ready to meet the expected demand. This is so not only of the active yards at Los Angeles Harbor, San Francisco Bay, Portland and Puget Sound, but of long dormant yards.

Strong bodies of prominent citizens are forming at all of these cities, determined to bring to the yards of their home port a just share of any steel shipbuilding that the Maritime Commission or private owners may have to offer.

Even organized labor is showing some signs of a desire to cooperate in bringing work to Pacific Coast yards.

Let's all get together and "Start Rebuilding our Pacific-American Merchant Marine in 1938."

"Let's Start
Our



American Merchant Marine Institute

One of the most significant recent developments in the American merchant marine situation is the complete reorganization of the American Steamship Owners Association.

As of July 1, 1938, this association became the American Merchant Marine Institute Incorporated. The first movement toward this reorganization occurred in February of this year, when the office of chairman was abolished and that of president substituted therefor. The movement was continued by the selection of Mr. Frank J. Taylor, former controller of New York City, as the first president. Mr. Taylor, prior to his election as controller, had been employed in the shipping business.

Incorporation with wider powers and a new name indicates that the shipowners of America recognize the necessity for more modern and more flexible policies in the conduct of their business and in their relations to the public and to government.

The objectives and policies of the Institute are described by president Taylor as follows:

"The purposes to be achieved by the formation of the American Merchant Marine Institute include the advancement of the mutual interests of the industry and the demonstrating to the American people of the essentiality of a strong merchant marine, not only for the purpose of national defense as a naval auxiliary but for the purpose of insuring that the nation shall possess at all times a merchant marine adequate for carrying its foreign and domestic waterborne commerce, owned and operated under the United States Flag by citizens of the United States, and composed of the best equipped, safest and most suitable types of vessels constructed in the United States and manned with an efficient citizen personnel.

"It will further be the policy of the institute to assist in removing, and to prevent the imposition of, any and all unnecessary regulations and restrictions impeding or tending to impede the development of such a merchant marine. The Institute will endeavor to obtain support for the American merchant marine from shippers, travelers, the general public and the government. It will strive to foster, promote, improve and maintain the best relationships among those engaged in the operation of the American merchant marine and all personnel employed therein. The Institute is now engaged in an energetic study with a view to stabilization of the relationship between the industry and its personnel, and has made marked progress in this direction during recent months.

"The membership of the Institute consists of companies owning and operating more than 4,000,000 tons of American flag ocean-going vessels, representing an approximate investment of $1,000,000,000 carrying freight and passengers to all points of the United States and foreign countries. The industry directly employs about 300,000 persons, to which should be added a great number who are directly or indirectly dependent on shipping. For example, in the vicinity of New York there are employed more than 250,000 workers as sailors, deckhands, longshoremen, mechanics and other workers connected with handling and transportation of steamship cargoes and passengers."

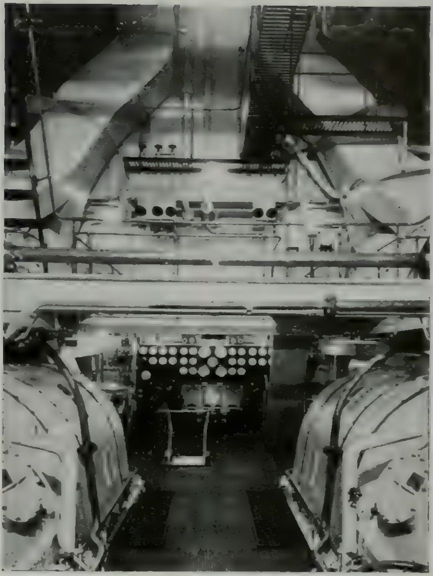
Officials of the American Merchant Marine Institute are:

President—Frank J. Taylor.
Secretary-Treasurer—R. J. Baker.
General Counsel—Judge John J. Burns.

The Board of Directors of the Institute are:

John M. Franklin—president, United States Lines Co.
Ralph C. Goodwin—vice president, Mystic Steamship Co.
Robert L. Hague—manager Marine Department, Standard Oil Company of N. J.
John J. Halloran—vice president and general manager, New England & Southern Steamship Co.

Rebuilding Merchant Marine in 1938"



incent K. Hull—president, New York & Cuba Mail Steamship Co.

harles Kurz—president, Pennsylvania Shipping Co.

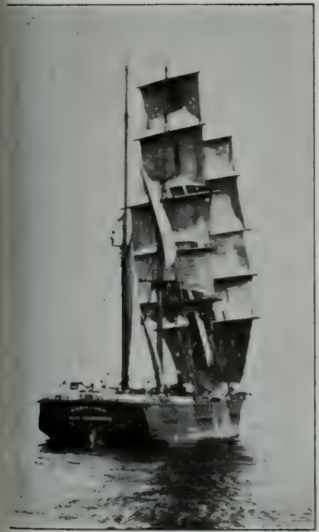
seph T. Lykes — vice president, Lykes Brothers-Ripley Steamship Co., Inc.

ulton Mann—executive vice president, Grace Line.

hn McAuliffe — president, Isthmian Steamship Co.

W. Warley—vice president, Calmar Steamship Corp.

This Board forms a very good presentation of Atlantic and Gulf oast owners and operators of merican shipping.



The Pacific American Steamship Owners Association has under consideration a similar move, and may become the Pacific Division, American Merchant Marine Institute, thus presenting a united American shipping industry in all matters pertaining to public policy and mutual cooperation in the advancement of the industry.

Matson "Golden" Ships Renamed

Early in July the Matson Navigation Company announced Hawaiian names for its "Golden" fleet and for the freighters taken over from the Los Angeles Steamship Company.

The ships and their new names are:

SS Golden Mountain—Changed to SS Olopana, named after a high peak on the island of Oahu.

SS Golden Sun—To SS Mokihana, meaning pungent fragrance. Mokihana is also the name of the official plant of the Isle of Kauai.

SS General M. H. Sherman—To SS Kaimoku, liberally translated into "beautiful turning of the tide."

SS Golden Horn—To SS Kainalu, meaning beautiful surf.

SS Golden Cross—To SS Kohala, which may be the district of Kohala on the island of Hawaii, or the leaves of the hala tree.

SS Golden Cloud—To SS Waimea, meaning misty waters.

SS Golden Dragon, in Polynesian becomes the Mahimahi or "Dolphin"—the nearest thing to dragons known to Hawaiians.

SS Golden Kauri—To SS Waipio, or arching waters (waterfall).

SS Constance Chandler—To SS Liloa, in honor of a Hawaiian king of that name noted for his fondness of "lying down inside the house." Liloa also conveys that desire.

SS Marion Otis Chandler—To SS Onomea, denoting sugar sweetness.

SS Helen Whittier—To SS Kalani, or "heavenly."

These vessels will be repainted, one at a time as they reach port, with black hulls, white superstructure, pale green trim, and buff funnels with blue stripes. The new names will be properly affixed at the time of painting. Approval of these name changes has been granted by the Bureau of Marine Inspection and Navigation.

Associated--
First of the
Tankers for the

In 1905 the Associated Oil Company (now the Associated Division of the Tide Water Associated Oil Company) began its experience in marine transportation of petroleum products through the purchase of the Coalinga-Monterey oil pipe line and the National Oil and Transportation Company. With the latter, Associated acquired a small fleet consisting of one steamer, two sailing vessels, and two barges. These five vessels had a total cargo capacity of approximately eighty thousand barrels.

As this article is being written there is on the way to San Francisco the new steam tanker Associated, latest addition to the fleet of Tide Water Associated, a vessel whose cargo capacity on a single loading is 25 per cent greater than the combined capacity of that fleet, and whose yearly capacity, due to better speed and faster turn around, would probably more than double that of the original five vessels.

The tanker Associated was built at the Chester, Pennsylvania, yard of the Sun Shipbuilding and Dry Dock Company to their standard 12,800 deadweight ton tanker design modified to suit the peculiar requirements of the coastwise and offshore services of the Associated Division of Tide Water Associated Oil Co. Contract for this ship was signed July 21, 1937, and the keel was laid November 9 of that year. On June 9, 1938, she was christened Associated by Mrs. E. L. Shea and

Principal Characteristics of Tanker Associated

HULL

Length, overall	459′ 6″
Length, between perpendiculars	442′ 0″
Breadth, molded	65′ 0″
Depth, molded to upper deck at side, amidships	35′ 0″
International tanker summer draft to bottom of keel	28′ 8″
Displacement, molded, at international tanker summer draft	17,320 Tons
Dead weight, at international tanker summer draft	12,752 Tons
Gross tonnage	8,407 Tons
Net tonnage	5,931 Tons
Cargo capacity, 98 per cent full	103,417 Bbls.
Lubricating Oil Tanks	1,364 Bbls.
Dry Cargo Hold	11,385 Cu. Ft.
Fuel capacity, 98 per cent full	10,450 Bbls.
Fresh water capacity	257 Tons
Speed, loaded, on trail	13 Knots
Cruising radius	19,000 Miles—65 Days
Normal crew	37 Men

MACHINERY

Engine: General Electric cross compound turbine with double reduction gear. Single screw.

High pressure unit	6,510 R.P.M.
Low pressure unit	4,660 R.P.M.
Shaft horsepower, normal at 85 R.P.M.	3,600 H.P.

Propeller—18′ 0″ dia. x 16′ 0″ pitch

Mail boilers: Two Foster Wheeler superheat control type

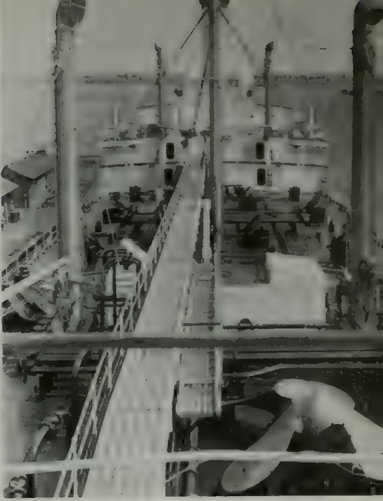
Total heating surface, each	5,970 Sq. Ft.
Working pressure	425 Lbs.
Total temperature	725° F.

Cargo pumps:

Three Kinney Heliquads (3,000 bbls. ea.)
One Kinney Heliquad (1,150 bbls.)

Total capacity	10,150 Bbls. Per Hr.

Modern Steam Tide Water Associated Oil Company



unched into the Delaware River. ler trial trip occurred June 16 and roved her to be better in horseower and speed than the specified equirements. She was delivered to er owners on June 28, 1938, and rrived at Los Angeles to take her lace in Pacific Coast service on July 2, 1938.

Addition of this new tanker gives ide Water Associated 7 large tankrs in Pacific coastwise and offshore ervice based at San Francisco. The ther tankers in this fleet, with their espective deadweight tonnages, are:

Frank G. Drum	11,049
Mericos H. Whittier	10,923
Tulsagas	10,936
Paul Shoup	10,815
Solana	9,795
Kewanee	5,103
Total deadweight	58,621

Advent of Associated with 12,752 deadweight tons has added approximately 22 per cent to the cargo capacity of this fleet.

Principal characteristics of hull and machinery are given in the table herewith. The hull is of the standard American tanker type, single screw, single deck with forecastle, bridge, and poop erections, semiraked stem and cruiser stern. All design features, materials, fabrication, and equipment of the hull and machinery are in accordance with or in excess of the highest requirements of the American Bureau of Shipping for this type of hull and conform with the rules of the Bureau of Marine Inspection and Navigation of the U. S. Department of Commerce.

Fifteen oil and water tight bulk-

Tanker Associated at outfitting dock, Sun Shipbuilding and Dry Dock Company.

WILLIAM F. HUMPHREY

President, Tide Water Associated Oil Company heads divide the hull into sixteen thwartship compartments. Of these eight are in the cargo tank space. These eight thwartship oil cargo spaces are further subdivided by oil tight parallel wing bulkheads port and starboard, 14 feet 6 inches inboard of the ship's side amidships. This arrangement provides 24 oil tight cargo compartments.

● Hull Design and Construction

The principal features of the design and construction of this hull, as described by John W. Hudson, naval architect of the Sun Shipbuildng and Drydock Company, are set orth in the following five paragraphs:

The lines of the hull were developed after considerable tank experimental work at the Model Basin in Washington, the problem being to obtain maximum volumetric capacity along with the form which would give minimum resistance, together with good propulsive efficiency. The lines aft have an exceedngly fine run resulting in an easy low of water to the propeller and to the rudder, which is of welded construction and stream line section of the floating type.

The raked stem has a soft nose, well rounded above the load water ine, ending at the upper part of the stem with a full curve, together with a flaring forecastle, which combinaion has proved itself able to maintain a dry ship in a head sea. The hull is of normal form with a cruiser stern and all major machinery loated aft. The pumproom, however, s amidships.

Longitudinal framing is employed hroughout the vessel with the exeption of the forecastle erection. Two continuous longitudinal bulkheads 18 ft. from the centerline on each side run from the engine room bulkhead to the forward bulkhead of the forward cofferdam. Transverse bulkheads divide the hull into eight cargo tanks at center and in wings, making a total of twenty-four main cargo oil tanks. Cofferdams are fitted between No. 5 and No. 6 tanks in the wings forward of the cargo oil tanks and between the fter cargo tank and the after fuel oil bunker. Fuel oil or ballast is also fitted in forward compartment aft of the fore peak bulkhead. Special tanks for the carriage of lubricating oil are fitted on each side of the bridge; there are eight tanks with a total capacity of 1364 bbls.

Extensive use of welding was employed in the fabrication of this vessel. All longitudinal and transverse bulkheads were welded, together with their connections, to the shell and decks. The bilge keel and all transverses in way of the longitudinal framing were all electric arc welded. Quarters for officers and crew are located in the usual steel deck houses forward and aft. Special care and attention has been given to the accommodations for both officers and crew, which are all commodious and of a very pleasing appearance. The bulkheads in the quarters are of steel faced panel construction. Large mess rooms are provided for both officers and crew. A spacious lounge is also provided for the use of the crew.

On deck the hatches to the various cargo oil tanks are oval, 6' x 4' x 30" in height. All hatches are fitted with screw lifting gear. Each cargo hatch is connected by a 4" vent pipe line led from the coaming to a pressure vacuum valve. Each vacuum valve is led to an 8" header up the mast, which is fitted with a flame arrestor. A complete pressure indicating system is fitted for the tanks consisting of "U" mercury gauges in the bridge with piping carried to each tank in accordance with current Panama Canal requirements for carrying Grade A products.

● Machinery Installation

In general the propulsion plant of the tanker Associated comprises a cross compound double reduction gear General Electric steam turbine driving a single screw shaft, and designed to deliver 3600 shaft horsepower at 85 revolutions per minute of the propeller shaft when fed with steam of 375 pounds pressure and 725° F. temperature at the throttle.

Steam is generated in two Foster Wheeler marine steam generators of the separately fired superheater type. This boiler equipment is of particular interest since it is of a new type and this is the first installation in merchant marine service. The following description, prepared by the manufacturer, sets forth the reasons for the new development and gives a full description of the installation.

● Steam Generating Equipment

This is not a radical design but rather a logical combination of engineering principles all thoroughly proved in service. It is an evolution in design resulting directly from the development of more effective and efficient turbine drives for merchant steamers.

In order to operate a turbine at maximum efficiency, it should be furnished with the highest pressure and highest temperature steam advocated by the manufacturer. Although this is relatively simple in stationary practice, a serious complication arises in marine service due to the sudden and sometimes frequent reversals of the turbine that are necessary while maneuvering. The construction of steam generators in the past has been such that if the reversing or maneuvering is quickly carried out, the tendency of the superheater is to provide a higher final steam temperature than under normal operating conditions. In other words, the superheater becomes very warm while no steam is passing through it and when the throttle is next opened the temperature is much higher than desirable.

A closely allied condition is that the temperature of turbine blading will fall rapidly when no steam is passing through the turbine, and to subject such relatively cool rotors to a high steam temperature is to impose an undesirable temperature shock of excessive severity.

Furthermore, many marine old line boilers have been so constructed that the production of small amounts of superheated steam resulted in overheating superheater elements and causing damage requiring replacements.

To overcome these costly limitations a complete marine steam generating unit good for 120,000 lb. steam per hour was built and tested extensively at 600 lb. pressure and 850 deg. F. final steam temperature. All requirements were met and the unit responded even more sensitively than had been anticipated. The basis of design was to provide a separate furnace for superheating the steam, but to incorporate it within the setting of the boiler unit. This was ac-

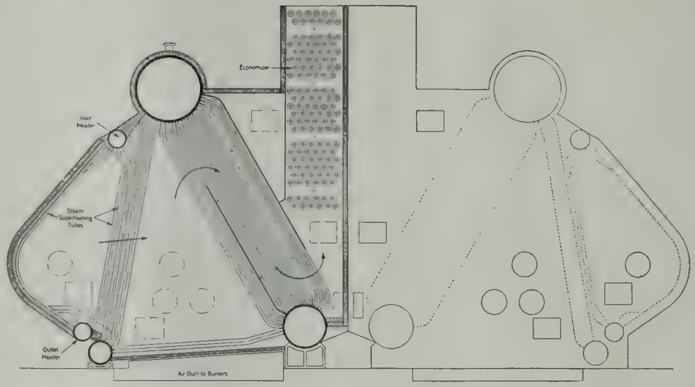
LOUIS D. JURS

Vice President and Director, Tide Water Associated Oil Company complished by modifying the three-drum, "A"-type marine steam generator design, already in successful use on merchant and naval vessels. With the new arrangement steam is generated in the boiler proper and passed to the separately fired superheater, having its independent oil firing for superheating the steam. The gases from the superheater furnace pass through a shallow screen of superheater and boiler tubes into the main boiler furnace whence they pass over boiler heating surface and economizer surface to the stack. The accompanying drawing shows the general design which is at once simple, accessible and easy to maintain.

Most of the superheating is the result of radiant heat applied to superheater tubes which form the top, bottom and sides of the superheater furnace. The temperature of superheated steam is controlled directly by the rate of firing the superheater furnace, and any desired amount of saturated steam may be taken directly from the boiler drum without the complication of a desuperheater, and without affecting the temperature in the superheated steam line.

Operation of these separately fired superheater boiler units has shown that a moderate superheat may be obtained in the superheated steam line without the superheater burner in operation, due to the proximity of the main boiler furnace. Saturated steam, as stated, is taken directly from the steam drum. It thus becomes evident that regulation of the final steam temperature is a definite and automatic protection against the overheating of superheater tubes. The rate of firing of the superheater furnace is controlled with a fixed maximum limit, and as the steam quantity is reduced the firing is correspondingly reduced and the tubes are not overheated. This is regardless of the quantity of steam being produced.

Due to the superheat being effected almost entirely by radiant heat, the final temperature is particularly sensitive to control through manipulation of the oil burner. This has the great advantage of reducing the influence of heat emanating from masses of refractory or hot gases and creating an undesirable lag in the temperature of superheater tubes, even with oil burners shut off. It has been found easy to control the steam temperature with in less than 5 deg. F.



Sectional and outline elevation of two separately fired superheater type Foster Wheeler marine steam generators as installed on tanker Associated.

In other words, the range of steam temperature available includes:

- **Saturated steam**—any quantity desired for ship use without affecting the superheated steam supply.
- **Moderate superheat**—from the superheated steam lines without firing the superheating furnace. Final temperature about 550 deg. F.
- **Superheated steam** — Range from 575 deg. F. to 850 deg. F., subject to instant regulation for reversing, maneuvering, or any condition of turbine operation regardless of quantity of steam used.

The physical characteristics of the two new steam generators include a fusion welded drum construction designed for 450 lb. operating pressure and for steam temperatures up to 850 deg. F. The maximum capacity of each unit is 50,000 lb. of steam per hour, including 35,000 lb. superheated to 750 deg. F. There are three boiler drums; the main steam drum is 42″ in diameter; the water drum carrying the main boiler tube bank is 27″ in diameter; and the water drum carrying the water screen between the main furnace and the superheater furnace is 14″ O. D.

The two rows of boiler tubes nearest the furnace in front of the main bank of boiler tubes, and the four rows between the main furnace and the superheater furnace are 2″ in diameter. The refractory floor of the furnace is cooled by a row of 2″ tubes connecting the two water drums. The balance of the heating surface consists of 15 rows of 1¼″ boiler tubes followed by a cast iron, extended surface marine economizer having 2″ steel tubes. Stack gas temperatures are reduced to less than 300 deg. F. in sea service, providing an overall efficiency of better than 88%. The economizer functions on a true counter current principle, the boiler feedwater being heated to 340 deg. F.

The two boiler units are set in battery and enclosed in a single sheet steel casing. The casings are thoroughly insulated and the furnace floors are finished with refractory, supported on the water tubes, backed with insulating material.

An important feature of the design is the air jacketing of the furnaces. This consists of admitting air to a double furnace casing at the rear, along the upper side of the superheating furnaces. This air for combustion passes downward across the back walls of both furnaces to the furnace floors, forward below the furnace floors to the fronts of the boilers and up over the furnace fronts to the oil burners. The air picks up much of the heat ordinarily lost by radiation and returns it to the furnaces, supplying the oil burners with moderately preheated air under low pressure.

The superheater consists of two

H. B. HANEY

Manager of Transportation, Associatea Division,
Tide Water Associated Oil Company

diameter headers, one at the and one at the bottom of the rheating furnace. These are rected by rows of $1\frac{1}{2}''$ alloy steel s, expanded into the headers, and bottom. Handhole plugs rovided through which the ele- tubes may be expanded into eaders. The superheating tubes the furnace on each side and design involves sufficient s to accommodate any expan- or contraction.

e layout of these units does not ve complicated arrangements pecial provisions for cleaning ces. Mechanical soot blowers ised in the main boiler tube and in the economizer. The heater, and the boiler tubes een the superheating chamber the main boiler, are on suffi- ly wide spacing to permit easy ing with brushes, should that ne necessary. These tubes are accessible and not shielded by s or rows of tubes in front of .

operation, this boiler is quick sponse and simple in control. is generated in the main fur- as required. Final steam tem- ure is developed in the super- r furnace, as desired for any tion of service. Separating functions in a manner that les accurate and instantaneous l is the objective attained.

e equipment includes Todd oil rs, Vulcan soot blowers, r smoke indicators, Ranarax machine and a complete com- nt of instruments for deter- g operating conditions.

fety Superheat Control

e to the fact that these boilers it firing control of steam tem- ure independent of steam gen- n, a system of emergency con- or the protection of the super- rs has been developed by the al Regulator Corporation. The iples involved are:

Protection against overheating high temperature and

Protection against overheating low volume of steam through uperheater and consequent in- ient cooling of some super- r elements. Both systems con- he flow of oil to the burner in uperheater furnace by means spring-loaded valve that is tripped shut through the movement of a solenoid. The latch when once tripped does not reset itself but must be opened by hand, thus insuring the personal attention of an operator.

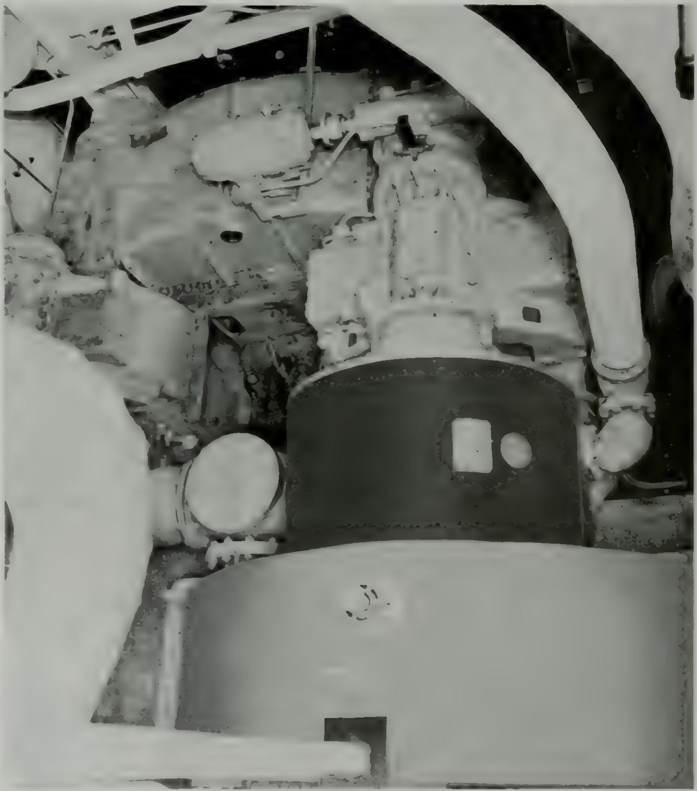
The solenoid is energized through a heavy duty relay and the relay is actuated by either of the two systems:

1. By maximum temperature.
2. By the differential pressure across the superheater.

First: the temperature control consists of a combined indicating and controlling instrument of the mercury expansion type connected to the superheater outlet header—the instrument being conveniently placed at the front of the boiler. This instrument has two sets of adjustable contacts ("A" and "B") covering a range of from 300 deg. F. to 900 deg. F. on a 6" dial scale.

Contact "A" closes a circuit at any predetermined temperature for which it is set, and rings a warning bell to notify the operator that attention must be given or the superheater burner will be shut down when the temperature increases another 10 or 15 degrees—depending upon the setting of the instruments. This is purely a warning of assistance to the operator.

Contact "B" will be closed when the final steam temperature reaches the maximum for which the control system is set—and the relay will energize the solenoid tripping the fuel valve. This will then require manual reopening and latching of the solenoid before the burner in the superheater furnace may be lighted. Reduction of the steam temperature—as stated—will not suffice to reopen the fuel valve.



View looking down from upper grating of engine room on the General Electric cross compound double reduction geared propulsion turbine.

GEORGE D. ZEH

Manager Marine Department, Associated Division,
Tide Water Associated Oil Company

Th second means of control op- ated through a spring loaded dia- ran within a steel casing and wi adjustable electrical con- ts The purpose of this control is sh t off the superheat when an ufcient amount of steam is pass- rough the superheater, as es- li ed by low pressure drop be- ee the inlet and outlet headers.

Th inlet and outlet headers are nted to the diaphragm by ½" and the control is sufficiently sive to cut out the oil burner a ifference in pressure from one- th of a pound per square inch to ounds per square inch. At the pressure drop through the eater there will be adequate li of the superheating tubes. e ontacts are normally open and vice is designed to work at an pressures of approximately ll per square inch. The extreme cy of this control in giving h sensitive setting at the low e differentials insures pro- ti of the superheater. When the an flow is so small that some of ements might be starved due rt circuiting through a few the fire is cut out in spite of fact that the temperature of the an might not exceed that at ch the superheater is designed to n.

cular interest attaches to the y expansion elements with lb as they have been devel- o give a speed more rapid ny other system on record. esponse to change in temper- even faster than with ther- les. No noticeable lag in op- has been determinable. They rapidly as the indication of t thermometers themselves.

Propulsion Turbines

the boiler location aft of and the turbines a comparatively ad of seamless steel pipe car- e main steam line to the valve controlling the high e turbine.

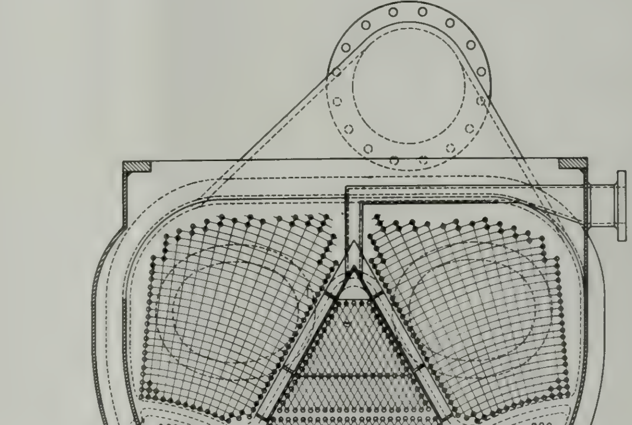
propulsion turbine is of the l Electric Company's latest ompound marine design, im- ype with solid rotors, and ses one high pressure tur- d one low pressure turbine s, one reverse element in the low pressure turbine casing, the gears and pinions necessary for speed reduction, and the valves and governing mechanism necessary for speed control.

With steam conditions of 375 pound pressure and 700 degrees Fahrenheit temperature at the turbine throttle, the normal rating of this unit is 3600 shaft horsepower at a propeller shaft speed of 85 revolutions per minute. The unit will be capable of operating continuously at a speed to produce 88 r.p.m. on the propeller shaft, which is equivalent to 3960 shaft horsepower.

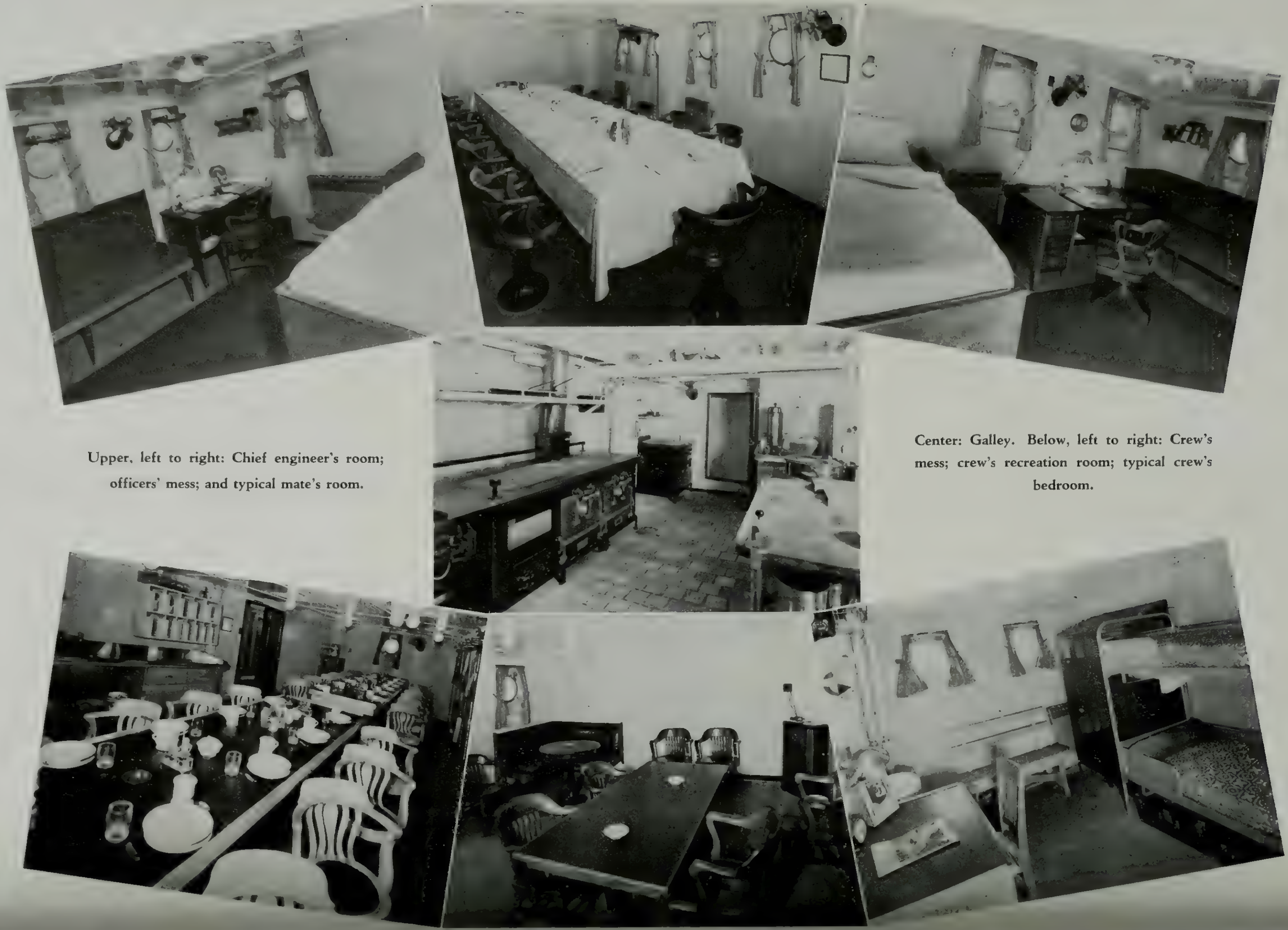
At normal rating output the high pressure rotor and pinion will revolve at the rate of 6285 revolutions per minute and the low pressure rotor and pinion at 4919 revolutions per minute. The high speed gear and low speed pinion will revolve at 767, and the low speed gear and propeller shaft at 85, revolutions per minute.

As installed in the ship, the weight of this unit will be 127,000 pounds, of which the high pressure turbine accounts for 7000 pounds, the low pressure turbine 30,000 pounds, and the gears 90,000 pounds.

Thrust of the propeller shaft is taken on a Kingsbury thrust bearing built into the forward end of the low speed gear casing.

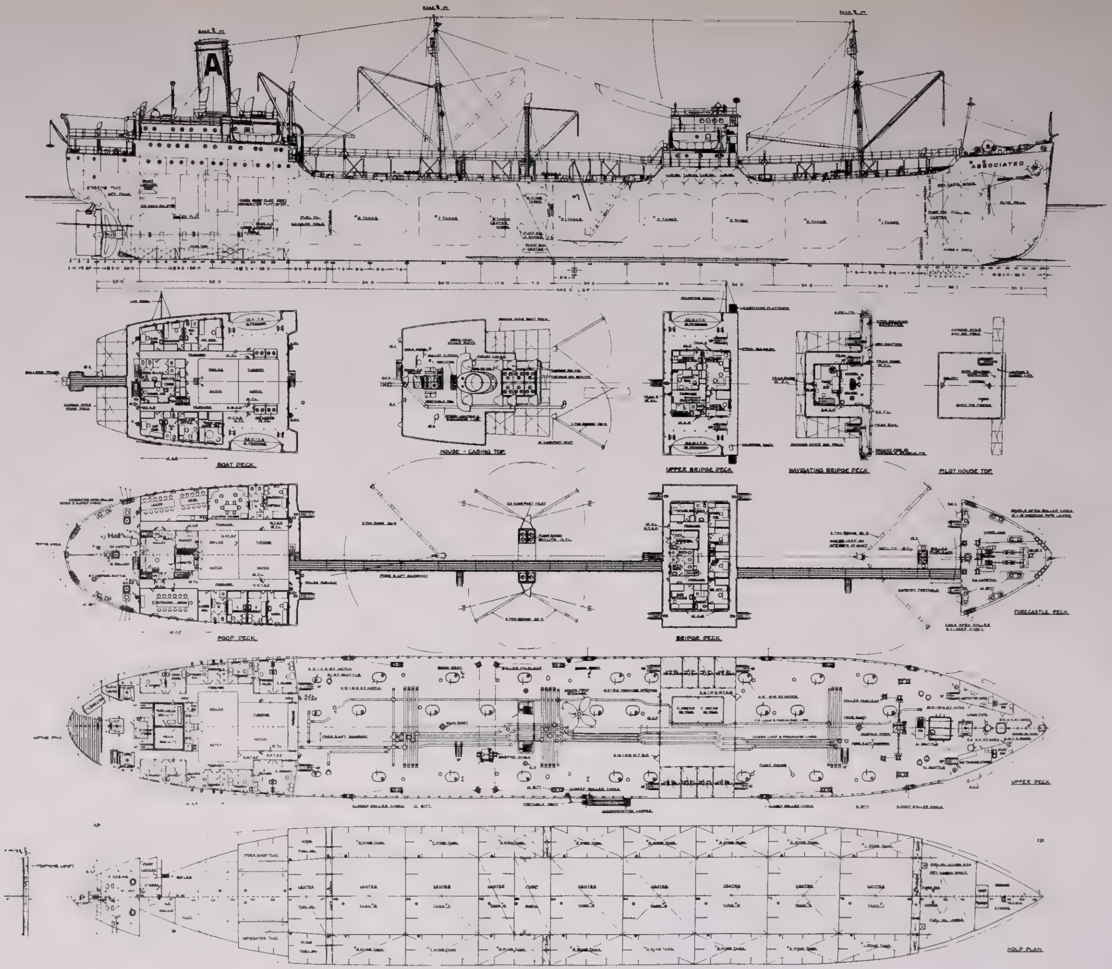


Sectional elevation of Foster Wheeler main condenser.



Upper, left to right: Chief engineer's room; officers' mess; and typical mate's room.

Center: Galley. Below, left to right: Crew's mess; crew's recreation room; typical crew's bedroom.



Inboard Profile and General Arrangement Deck Plans New Tanker Associated.

ompany and consists of a two hun-ked Watt MOPA intermediate freuency transmitter, a two hundred Vatt high frequency (short wave) ansmitter, an all-wave receiver ith a standby receiver to enable ie operator to maintain watch on ie distress frequency even though usy on other frequencies, and a Iackay Radio auto alarm, mounted i panel form. Also mounted on the ame panel are the battery charging nits and main switches. All wiring i the radio room is run in sub-deck hannels, leaving the bulkhead enrely free and clear. Mackay Radio so supplied and installed the Type 95-A Kolster Radio Direction inder installed on the bridge of the ssociated.

Discharging Cargo

On this tanker the service requires hat at least four grades of petroum and its distillates, and in adition two grades of lubricating oil, e loaded, transported and disharged without danger of contamiation. The piping and pumping intallation is designed to do this with ie maximum efficiency, dispatch nd safety.

Three Kinney Heliquad Model G main cargo pumps are installed on this tanker and one cargo stripping pump. Each of these pumps is equipped with horizontal duplex suction connections and with a vertical discharge.

Each main cargo pump has a capacity of 3000 bbls. an hour against a maximum pressure of 125 to 150 pounds, handling all grades of petroleum products from gasoline to fuel oil. The stripping pump has a capacity of 1000 to 1200 bbls. an hour.

These pumps have bronze cylinder and head liners and are unusual in the rotary pump field in that all bearings as well as the timing gears are entirely outside of the pump chamber and yet have only two stuffing boxes instead of four as is usually the case.

The bearing design is such that the position of the rotors is maintained central in the pump housing regardless of the trim of the vessel. This prevents metallic endwise contact.

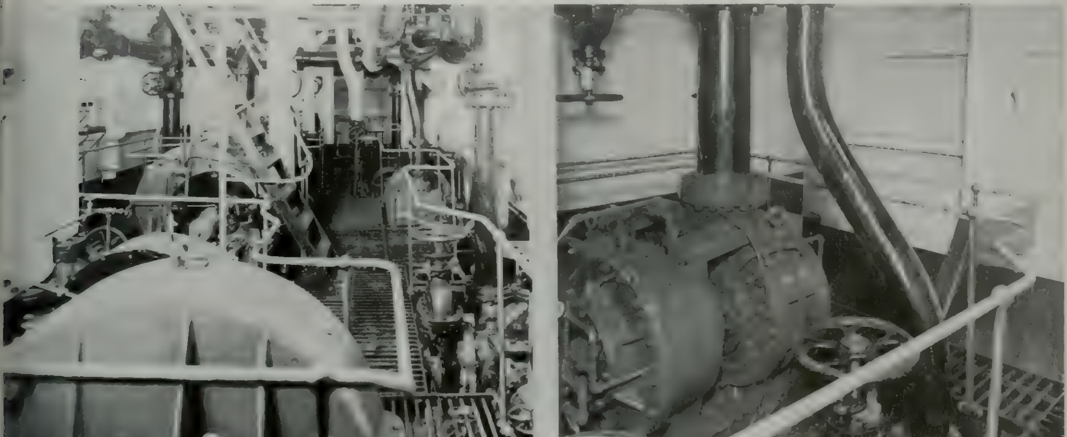
This new design maintains other features regularly supplied with Kinney Heliquad pumps, including labyrinth rings and chamber connected to the suction side of the pump, thus requiring that pumps be packed against suction pressure only. In addition, each stuffing box is fitted with packing specially designed for gasoline and oil cargo and provided with a leakoff ring which is connected to the suction of the pump. The packing runs on stellite shaft sleeves.

Timing gears and bearings operate in a separate oil tight case with a combination of splash and flood lubrication provided by a small built-in rotary pump.

Bearings, nearest to the pump chamber, are the latest development in solid roll, heavy duty, industrial roller bearings; duplex heavy duty precision ball bearings are used at the coupling end of the unit.

These pumps are direct connected through flexible couplings and reduction gears to General Electric high speed steam turbines.

The cargo discharge piping system is designed to take care of the special problems involved in handling four petroleum commodities in the same tanker. Fuel oil, diesel oil, gasoline, and kerosene can be carried and discharged simultaneously without contamination.



argo pump room on tanker Associated, showing, at left, the Kinney pumps and General Electric turbine drives; at right, a close up of one of the Kinney Heliquad pumps.

● Engine Room Auxiliaries

Circulating salt water for the main condenser is provided by a Worthington vertical shaft centrifugal pump driven by a 60 horsepower electric motor and having a capacity of 6200 gallons per minute. For servicing the auxiliary condenser with cooling water a Worthington horizontal shaft centrifugal pump is installed. Driven by a 20 horsepower electric motor this pump has a capacity of 1900 gallons per minute.

Two Worthington 7½ horse power motor drive vertical shaft centrifugal pumps deliver the condensate to the hot well.

There are two main feed pumps of the Worthington 2 stage volute type each driven by a B. F. Sturtevant steam turbine and each capable of delivering 115 gallons a minute at 500 pounds pressure. A Worthington double acting vertical simplex steam feed pump is installed as an auxiliary.

On its way to the boilers the feed water passes through 3 heaters and is heated to 220° F. Two of these heaters are of the well known Davis "Paracoil" type. The third is the Worthington deaerating heater with a capacity of 60,000 pounds per hour.

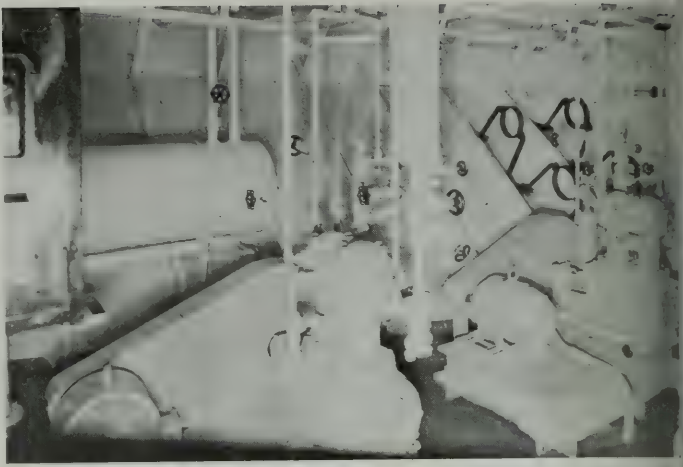
Other pumps connected with the engine room are mostly Worthington, including:

Forward fuel oil transfer—steam horizontal duplex 7½" x 6" x 10"; after fuel oil transfer—steam vertical duplex 14" x 10" x 18"; general service and ballast—steam horizontal duplex 12" x 8½" x 12"; fire and Butterworth service pump—a horizontal centrifugal driven by a Whitton 100 horsepower steam turbine and having a capacity for 450 gallons per minute at a head of 449 feet and for 600 gallons per minute at a head of 280 feet.

The fuel service to burners is handled by Northern Pump Co. rotary pumps. Lubricating oil is kept clean by a Sharples centrifuge.

● Deck Machinery

The Pacific Coast service in which Associated will be operated requires loading in open roadsteads such as Monterey and Ventura, California, where the loading pipe line is picked up offshore after the tanker is warped into exact position and attached to 3 mooring buoys. Very rugged deck machinery is indicated for this service.



Carrier-Brunswick refrigerating machinery on the tanker Associated.

American Engineering Company supplied all of the deck machinery and the steering gear, which included:

1—size No. 10 electro-hydraulic steering gear having two prime movers, each consisting of a Hele-Shaw pump driven by a 20 horsepower electric motor. The steering gear is controlled from the pilot house by hydraulic telemotor. The auxiliary hand steering gear is of the hydraulic type operated from the poop deck by a hand operated Hele-Shaw pump.

1—12" x 14" steam spur geared windlass with two wildcats for 4¼" stud link chain and two large size heavy duty warping heads.

1—9" x 12" forward cargo winch.

1—9" x 12" midship warping winch with large size warping heads. These 9" x 12" winches have a capacity of 16,000 pounds pull at 100 F.P.M.

4—10" x 12" heavy duty warping capstans having a capacity of 25,000 pounds each. The capstans have a 26" warping head with the engine on the deck below. The engine is totally enclosed in a casing.

Arrangement of this deck machinery and the fair leaders, blocks, chocks and bollards through which it functions is plainly shown on the deck plans reproduced herewith.

Naco cast steel stud link anch chain is used.

Two 50 foot 5 ton booms a installed on the forward side of th foremast and provision is made t shift either or both of these boom to the after side of the mast if desirable. One 50 foot 5 ton boom i installed on the after side of th after mast. Port and starboard the erection over the pump roo there is fitted a 24 inch diamet combination king post and ven Each of these king posts carries tw 30 foot 4 ton booms. On the fo ward end of the poop there are tw 18 inch diameter king post ven each carrying a 30 foot 2 ton boon These booms, coupled with amp provision of winch power and t adequate provision of fairleade bitts and chocks, enable the eas handling of heavy weights on a parts of the deck of this ship.

A large part of the manila haws and rope used on this job was fu nished by the Wall Rope Work Incorporated, and is of the Speci Wallcore construction.

This installation of deck machinery and fittings is very complete an is laid out to take care of eve factor involved in the orderly moo ing of the ship at a dock or at moo ings in the roadstead.

● Auxiliary Power Plant

To carry the electric auxilia power load and the lights throug

it the ship three turbo electric gen-
ating sets are installed on the
namo flat. Two General Electric
25 K. W. 240 volt direct current
rbine drive generators supply cur-
nt to the motor circuits for reg-
ar operation. A 50 K. W. 240 volt
rbine drive generator is installed
r emergency. The lighting circuits
perate at 110 volts, deriving cur-
nt at that voltage from a pair of
tary converters. The connected
ectric motor load is a little over
0 horsepower.

A General Electric switchboard
the latest type controls the elec-
c power and light circuits.

Steam exhausted from the turbo
nerators, cargo pumps and other
xiliaries is condensed in a 1600
uare foot Foster Wheeler auxil-
ry condenser. It has capacity to
ndense 30,000 lb. per hour at a
cuum of 26 in. Hg.

Navigating Equipment

The gyroscopic compass equip-
ent is controlled by a Mark IV
perry Gyro Compass of the latest
pe with thermionic follow up.
his precision instrument actuates
ree bearing repeaters, one steer-
g repeater, and one radio direc-
n finder repeater. The three
aring repeaters are located as
own on the plans— one on each
ng of the navigating bridge, and
e on top of the pilot house.

The Sperry Gyroscope Company
so supplied and installed one rud-
r angle indicator, one course re-
rder and one incandescent spot
pe searchlight.

A Fathometer for continuous
ho depth sounding and visual
pth indication is installed in the
heelhouse. As a further safeguard,
electrical machine for positive
pth sounding with wire and
ight is installed on the bridge
ck.

A Kent Clear Vision Screen as-
ts the navigating officer when
st, rain, snow, hail or sleet fog
e pilot house windows.

Accommodations

As will be noted from the deck
ans and illustrations, the officers'
d crew's quarters aboard this ship
e very spacious, conveniently ar-
nged, commodiously furnished,
equately ventilated, and amply il-
minated. In fact, these accommo-
tions were deliberately planned
to be so far ahead of the present standards in these respects that this ship will be modern in crew accommodations over her estimated life of 20 years in service.

Not more than two crew members occupy any one room, and most of the rooms are large enough to be "certified for (5-7) seamen." Each room is provided with hot and cold running water, with wall plug for radio, with individual reading lights at each bed, with large individual lockers, and with the highest quality mattresses. A large lounge and recreation room is provided, equipped with game and writing tables, easy chairs and settees, radio, and other attractions.

Wherever the accommodations come in contact with or are adjacent to heated surfaces, such as the fidley, the uptakes, or the decks over the boiler room, these surfaces are insulated with Bacite, the new Bird-Archer cold set cement which prevents the passage of heat.

In fact, one would have to go to a very modern first class hotel to be able to rent the comforts that are provided for the working force of this tanker.

Two large refrigerating chambers for galley stores are served by two Carrier No. 13 two ton capacity refrigerating machines each driven by a 5 horsepower 1750 r.p.m. G. E. motor and each able to carry the entire load. In the galley a Frigidaire service refrigerator takes care of temporary cold storage. The cooking stove is a Ray oil burning range and the galley is equipped with all the modern tools necessary to produce tempting and varying menus from the large stock of provisions in the cool storage chambers.

● Oil Tank Gages

Shand and Jurs Company of Berkeley, California, supplied S. S. Associated with cargo breather valves for oil tanks, with pressure vacuum gages and with their automatic tank gage for measuring the depth of contents of cargo tanks. This gage indicates the measurement on a stainless steel tape which can be read through a plate glass window equipped with a wiper.

Shand and Jurs Company are equipping the ship here with steam jet exhausters for gas freeing the cargo tanks.

Associated arrived at San Francisco on her maiden voyage July 25. On the following two days she was visited by press correspondents and by large numbers of interested shipowners, marine engineers, naval architects, and lovers of shipping. Unanimous were the expressions of approval and praise for another fine modern unit added to the Pacific American merchant marine.

Officers on Associated are: Captain Leland E. Hawkins, master; Louis J. Thompson, 1st mate; Robert B. O'Brien, 2nd mate; Elmer R. Eastman, 3d mate; Aaron S. Hershey, chief engineer; Joseph T. Stewart, 1st assistant; Justus J. Van Loben, 2nd assistant; and Edward C. Berlin, 3d assistant.

NEW HAGAN AGENTS

Griffin Chemical Company of San Francisco announce that they have been appointed California representatives for the Hagan Corporation and Hall Laboratories, and will handle the marine business for these companies, in conjunction with Bull & Roberts of New York as consultants.

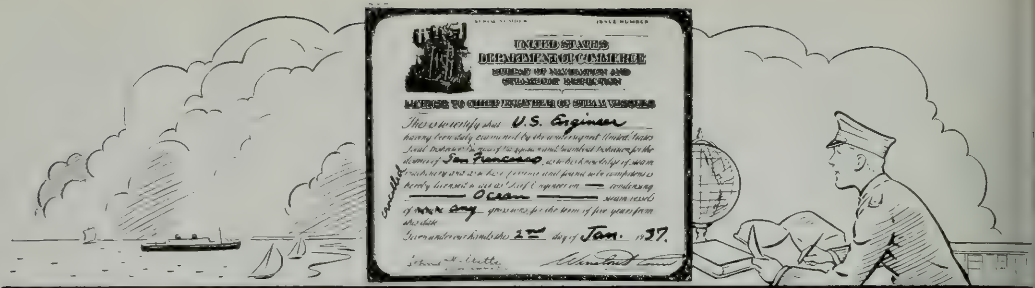
Clyde F. Williamson will be the manager of the Marine Department in San Francisco, at 1000 Sixteenth Street, and Ray L. Sullivan will be in charge of the Marine Department in Los Angeles, at 1925 East Olympic Boulevard.

Griffin Chemical Company will be prepared to carry on engineering service as was done by the former representative, and will keep a sufficient stock of Hagan Phosphate and other materials needed, in both Los Angeles and San Francisco.

The business of Paul Bovard, who formerly represented the above companies, and who also operates the California Filter Company, had increased to such proportions that he did not feel that he could continue to handle the Hagan and Hall business.

The boiler water analyses will be done in the Griffin Chemical Company laboratory in San Francisco in conjunction with Bull & Roberts of New York.

Hagan Combustion Control and other steam plant equipment sold by the Hagan Corporation will be sold in California by Griffin Chemical Company.



UNITED STATES
DEPARTMENT OF COMMERCE
BUREAU OF NAVIGATION AND
STEAMBOAT INSPECTION

LICENSE TO CHIEF ENGINEER OF STEAM VESSELS

This is to certify that U.S. Engineer

San Francisco

Ocean

any

2nd day of Jan. 1937.

cancelled

Your Problems Answered

by "The Chief"

The word "Cancelled" was inscribed on face of the above license at the direction of the Bureau of Marine Inspection and Navigation. As used here it means "Specimen Copy."

Questions From The Field

QUESTION

In the June issue you gave three formulas for the corrected sounding of double bottoms when the ship has a forward dip.

I've worked all three problems with different figures and dimensions and found them to be correct, with exception to formula No. 2 and the figures you give.

Your answer is 2.04 and mine is 2.93. I realize .89 of an inch is a mere trifle, but you must realize the position I'm in, not knowing whether I'm right or not.

Robert S.

ANSWER

Thanks to reader S. for alertness, and to him goes a year's subscription to the Pacific Marine Review, paid for by "The Chief." Please send in your address at once so that we may mail your copies regularly.

You are right. The middle column of page 25 of the June issue should read:

P=1.25+4.8=6.05, not 5.05 as shown. This then gives:

$$C \quad \frac{6.05 \times 6.05}{2 \times 6.24} \quad \frac{36.40}{12.48}$$

C=2.932, or 1.68 inches more than measured.

Note that these formulas are good whether the ship is down by the stern or by the bow.

QUESTION

In resetting a reduction gear assembly after repairs, should the alignment of high speed pinion to the turbine shaft be exactly level, i.e., line to line, or should it be raised slightly to allow for the lift of the turbine shaft when it warms up?

F. R. A., San Francisco.

ANSWER

A direct and straightforward answer to this question is difficult, as every design of geared turbine is different.

The turbine shaft bearing usually is supported on the exhaust casing assembly, which does not warm up very much and would have negligible lift. Furthermore it is customary to bolt the gear casing which supports the pinion bearing to the turbine casing so that any lift would be transmitted to the gear casing.

Of course, it is excellent practice to make the final alignment or check with the equipment at as warm a temperature as possible. Circumstances may dictate an allowance for temperature change of a few mils, but no general figure could be given.

There are cases, of course, where high pressure turbines are connected to a pinion with the resulting lift under running temperature. In any event, this connection volves the two turbine bearings line with the two pinion bearin It is accepted practice to put so kind of a flexible coupling, coupling, or flexible shaft quill tween them. More than two be ings in line on a rigid system difficult.

The accompanying cut shows popular form of connection, which the flexibility of a shaft used to take care of position m alignment to a slight degree, a also a pin coupling is used to ta care of angular misalignment.

We will discuss flexible conn tions in more detail in anoth issue.

QUESTION

In your June issue you referr to correction of tank soundings allow for trim of ship. You referr to the angle ratio A as being eq to the number of feet off trim vided by one-half the length of t ship in feet. This does not se right. Please explain further:

Wm. A. R.

ANSWER

We erred in not using the m practical expression for trim of t ship. The trim, as logged, is t draft fore and aft in feet and fr tions. The difference between fore and aft readings is used as off-trim data. Therefore the an ratio A should be figured as difference in the draft readings vided by the length of the sh Please make this change to y copy.

Changes in Power Plants

QUESTION

What are the contributing factors leading to the extensive changes in some of the existing marine power plants?

ANSWER

There are two principal reasons which warrant these changes the need for an increase in power to give a faster speed and competitive schedule, and the need to reduce fuel consumption to reduce operating costs. Other contributing factors are plant wear and obsolescence. One outstanding reason is the fact that improvements in boilers and engines have advanced faster than ships have been scrapped, with the result that some ships can be modernized at a saving over new ships.

QUESTION

What can be done to a good ship with a good boiler and reciprocating engine to increase the power 10 to 25 per cent, with the corresponding increase in speed?

ANSWER

This has frequently been done. In Europe this system is called the Bauer-Wach system, after the German engineers who first proposed it, but there is nothing difficult nor abnormal about it sufficient to warrant retaining this name.

The method essentially is to add a geared steam turbine to the engine to take exhaust steam from the engine and expand it to the condenser.

QUESTION

With this system, why interpose the turbine when the engine is already capable of expanding to the condenser?

ANSWER

It is uneconomical to hold the vacuum on an engine much better than about 26 inches. A better vacuum cools the condensate to a lower temperature and does not at the same time develop any more power in the engine. The reason for this is that it is the vacuum or back pressure on the piston that determines power in engine, not that in the condenser. Indicator cards will show that the exhaust pressure is never much lower than 24 to 26 inches regardless of the condenser vacuum. The volume of steam at higher vacuums is too great to handle through the exhaust ports and trunk.

On the other hand, the nature of the turbine is such that it can expand steam usefully to as high a vacuum as can be maintained by the temperature of the circulating water. Thus much power is available to the turbine that is not available to the engine.

QUESTION

Is a reversing turbine necessary for this combination?

ANSWER

No. Installations have been made both with a reversing element at the exhaust end of the turbine and without any reversing element. In either case linkage between engine throttle and reversing lever is necessary, in one case to by-pass engine exhaust to condenser on reversal, and in the other case to close the ahead and open the astern valves on the turbine. In either case, the size of the valves to handle the low pressure steam is such as to make it necessary to move by steam or oil pressure, and the simplest method is highly desirable.

QUESTION

What pressures are customary with these combination drives?

ANSWER

It is customary to increase the back pressure on the engine a little so that instead of exhausting it into a condenser at 26″ vacuum it will be exhausted into the exhaust turbine at, say, from 16 to 20 inches of vacuum. The turbine exhausts into the condenser at as much as 29 inches with normally cool sea water.

QUESTION

Why not increase the pressure on turbine and increase back pressure on engine, based on the general theory that if a little change is good, more change is better?

ANSWER

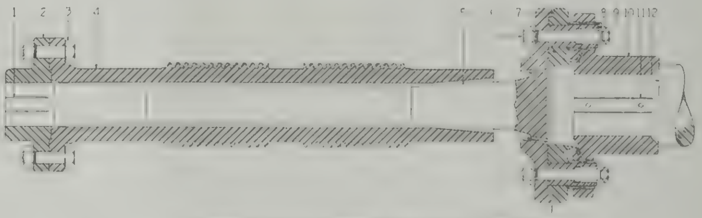
As far as economy is concerned, it might be bettered by increasing pressure on turbine to atmospheric or even on up to 25 to 50 lbs. gage. However, this would unbalance the engine, requiring a different ratio of diameters of cylinders and cut-off. Furthermore it would require a larger turbine, so that if we were to go much further in that direction we might as well scrap the engine and make it a complete turbine job. We should remember that from atmospheric pressure to a good vacuum there is as much power available as from the ordinary boiler pressure to atmospheric pressure.

QUESTION

Does the turbine drive direct to the same shaft as the engine?

ANSWER

A direct and rigid coupling between the two is impractical on account of the tremendous increase in the size of the gears which would be necessary. The turbine is geared to the engine through a set of reduction gears of a size to handle the turbine with a good safety factor. Then in either the main or intermediate gear a spring or cushion spider is mounted. This takes up the shock load on the gears, due to the large inertia of the turbine rotor at its high speed being forced to follow the engine speed, which will vary up and down in one revolution. This coupling through gears of



Assembly of High-speed Pinion with Couplings

1	Key for 2 and 5	7	Coupling flange—male half
2	Flanged coupling for 5	8	Bushing
3	Body bound coupling bolt with nut and cotter for 2 and 4	9	Coupling pin
4	Hollow or quill-type pinion	10	Flanged coupling for 12—female half
5	Flexible shaft with coupling flange	11	Key for 10 and 12
6	Bolt with nuts, locking plates, and washer for 5, 7, and 10	12	Turbine shaft

the steady, spinning turbine and the jerky engine is the real problem in combination drives. It is much better to have one on one shaft and propeller and the other on another, but this is usually impossible.

Another method characteristic of the Bauer-Wach system, for getting this coupling without injury to turbine or gears, is through the use of the hydraulic coupling.

This will be covered in our next issue.

Engineers' Licenses

The following list shows the licenses granted during the month of June to engineer officers of the merchant marine at Pacific Coast offices of the Bureau of Marine Inspection and Navigation:

SAN FRANCISCO

Name and Grade	Class	Condition
Harry Knouff, Chief Eng.	OSS, any GT	RG
George F. Voyer, Chief Eng.	OSS, any GT	RG
Philip J. Webster, Chief Eng.	OSS, any GT	RG
Fred J. Jackson, Chief Eng.	OSS, any GT	RG
Harold L. Jarvis, 1st Asst. Eng.	OSS, any GT	O
Elmer Puccetti, 1st Asst. Eng.	OSS, any GT	RG
Fred Bangs, 1st Asst. Eng.	OSS, any GT	RG
Albert W. Koehler, 1st Asst. Eng.	OSS, any GT	RG
Jacob Freeman, 1st Asst. Eng.	OSS, any GT	RG
Edward J. Haddon, 1st Asst. Eng.	OSS, any GT	RG
Ernest S. Lax, 1st Asst. Eng.	OSS, any GT	RG
Carl R. Bower, 1st Asst. Eng.	OSS, any GT	RG
Marvin M. Mumma, 1st Asst. Eng.	OSS, any GT	RG
Guy D. Ripley, 1st Asst. Eng.	OSS, any GT	RG
Harry Bontempo, 2nd Asst. Eng.	OSS, any GT	O
Victor K. Wieczorek, 2nd Asst. Eng.	OSS, any GT	O
Herbert C. Basford, 2nd Asst. Eng.	OSS, any GT	RG
Howard S. Francis, 2nd Asst. Eng.	OSS, any GT	RG
Jesse L. Noel, 2nd Asst. Eng.	OSS, any GT	RG
Willis L. Steen, 2nd Asst. Eng.	OSS, any GT	RG
Fred Jennings, 2nd Asst. Eng.	OSS, any GT	RG
Homer H. Hall, 2nd Asst. Eng.	OSS, any GT	RG
William F. Doyle, 3rd Asst. Eng.	OSS, any GT	O
Voile O. Hardy, 3rd Asst. Eng.	OSS, any GT	O
Henry M. Norris, Chief Eng.	OMS, any GT	O
Arthur Gravatt, Chief Eng.	OMS, any GT	RG
Victor K. Wieczorek, 2nd Asst. Eng.	OMS, any GT	O

PORTLAND

Name and Grade	Class	Condition
Orville N. Baker, Chief Eng.	OSS, any GT	RG
Hugh W. Roberts, Chief Eng.	OSS, any GT	RG
Elbert E. Hawkins, Chief Eng.	OSS, any GT	RG
Frank M. Robertson, 1st Asst. Eng.	OSS, any GT	RG
Philip S. Morgan, 2nd Asst. Eng.	OSS, any GT	RG
Francis J. Walton, 3rd Asst. Eng.	OSS, any GT	O

SAN PEDRO

Name and Grade	Class	Condition
Thomas L. Skillington, Jr., 1st Asst. Eng.	OSS, any GT	RG
Edward C. Wissing, 2nd Asst. Eng.	OSS, any GT	RG
Kessler Taylor, 2nd Asst. Eng.	OSS, any GT	RG

SEATTLE

Name and Grade	Class	Condition
Charles G. Coles, Chief Eng.	OSS, any GT	RG

Abbreviations: GT is gross tonnage; RG is raised grade; O is original license; OSS is ocean steamer; OMS is ocean motorship.

Literature of The Industry

Duronze Manual, a new 80-page technical handbook covering the physical properties and applications of four high strength silicon bronzes pioneered by Bridgeport and sold under the trade name "Duronze Alloys" was recently released by the Bridgeport Brass Company.

While possessing the common features of high copper silicon bronze, the four alloys which compose the Duronze group differ widely in their physical characteristics, methods of working and specific fields of application. The ever broadening range of industrial demands, resulting partly because of the more severe requirements of modern industrial applications and the recognition that metals must stand up without the possibility of sudden failures and weakening due to wasting away from corrosion, have made Duronze Alloys outstanding in non-ferrous metallurgy. They rank in importance with the development of stainless steels in the ferrous industry.

Duronze Alloys are recommended for severe service in outdoor construction where steel, brass and copper are not strong enough nor have sufficient corrosion resistance They are not subject to corrosion or season cracking. Briefly, the Duronze Alloys have the following properties and applications:

Duronze I has exceptionally fine cold working properties, its high strength being the result of cold drawing or rolling.

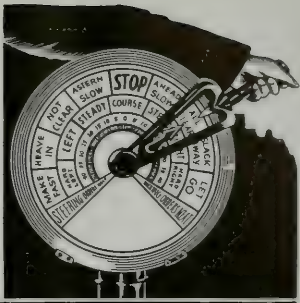
Duronze II has the strength and toughness of mild steel plus the corrosion resistance of fine bronze.

Duronze III is a hot working alloy that is surprisingly strong and hard yet quite free machining. It hot forges readily and is excellent for making high standard forgings and screw machine parts.

Duronze IV is supplied in tube form and is recommended for the manufacture of condenser tubes to resist corrosion under conditions which destroy ordinary materials. It is recommended for resisting impingement corrosion from aerated sea water and is finding greater application in salt refineries because of its resistance to corrosion from strong alkaline solutions.

Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A DEPARTMENT FOR DECK OFFICERS

Damage to Cargo

Some Notes on the Principal Causes for the Serious Losses Through Damage to Cargoes In Loading, In Discharging and In Transit

One of the greatest losses in the ipping business is the cost of aims paid for damaged cargo. It the duty of every ship's officers to iminate as many of these claims as ssible. Listed below are some of e principal causes of damaged rgo which may be of some assistce in reducing this unnecessary aste:

Damage in Loading and Unloading

(a) The careless use of longshoreen's hooks on fragile and valuable rgo.

(b) Loading fragile packages in a ng with heavy cases or material.

(c) Carelessness in hoisting, such hitting the hatch combing, landig a load too fast, or jerking when e load is picked up.

(d) Carrying away of cargo gear, l carrying away, or guy breaking.

(e) Loss of articles from pilfere. This loss increases as more per containers are used. Most ni-valuable cargo such as hats, othes, shoes and tobacco are now ipped in paper containers, and st be watched and stowed in ces where they are not easily acssible while in transit. Careful tch over cargo is necessary not only to prevent pilferage, but to prevent stevedores from opening packages to see what is in them—causing damage, although taking nothing.

(f) Stowing and piling damages goods, both on the ship and on the dock—cases being roughly handled, heavy packages piled on fragile goods, stowing sack goods, etc., against sharp corners or projections, or poor stowage allowing pile to fall down—all these contribute to damage claims.

(g) Weather damage such as loading grain, flour, iron and tin plate during rain without adequate protection.

(h) When loading powder or ammunition from a lighter, the lighter should be on the weather side, whenever there is danger of sparks.

(i) Much cargo is damaged by being placed on dirty ceiling without dunnage, or from broken sweat battens.

- **Chafing**

The ship's motions are so varied and great that there is much danger of chafing. Chafing will injure many commodities, especially those packed in fragile containers, or not covered at all. Stationery, silk, fruits, glassware, furniture, rope, uncrated automobiles, machinery and rolls of paper are among the articles easily damaged in this way. Care in stowage and the use of dunnage reduces this damage.

- **Crushing**

Damage may be caused by careless handling in loading or discharging, by bad stowage in the hold, or by inadequate packing. Containers easily broken should not be stowed against stanchions or frames where the weight from other cargo will break them. Barrels or other cargo in the bottom tiers should be floored off with dunnage to distribute the weight.

- **Moisture**

Damage to cargo from moisture is great because there are comparatively few articles that are not themselves, or do not have their containers, injured by water. Cloth stuffs are discolored and decayed, polished metals or machinery is rusted, foodstuffs of most sorts are rendered unpalatable, fibers and grains heat and ferment, and many minerals and chemicals are dissolved or change in chemical composition. Some classes of goods, such as fine cloths, drugs, stationery, polished metals, leather and foodstuffs are seriously damaged by water vapor alone.

Moisture may originate from many sources and be carried through the cargo by different means. It may come from wet goods stowed in the hold, from dampness through loading in the rain, or it may be condensed on deck beams or sides and drop down on the cargo. In some parts of the world air itself is heavily laden with moisture which condenses and collects on cool surfaces.

The following commodities heat with moisture: charcoal, coal, flour, gunny bags, hay, hemp, jute, leathers, lime, oakum, paper, rags, rice, sawdust, starch, sugar, superphosphate, tobacco, water proof clothing and wool. The sweating that results is not always the most serious consequence. The goods themselves may be, and often are, rendered entirely worthless, and in many cases heating will result in spontaneous combustion.

Moisture promotes the agents of fermentation and increases the strength of obnoxious odors.

● Heat

There is an enormous amount of damage to shipments of goods by excessive heating caused by:

(a) High air temperature on tropical voyages, which is especially pronounced if there is lack of ventilation in the hold.

(b) Exposure of goods to the hot rays of the sun.

(c) Exposure of goods to the heat of the engine room or steam pipes.

(d) Spontaneous heating of commodities.

The damage that will result from such heating depends entirely upon the nature of the commodity. Many important articles of commerce can successfully withstand any heat that is liable to be encountered on the voyage, but others suffer considerable damage at comparatively low temperatures. Moreover, the damageable commodities are rapidly increasing in relative importance.

Heating, especially when combined with moisture, increases bacterial activity and the process of germination and will therefore damage perishable foodstuffs, such as meat, fruit, butter, cheese, syrups, liquids of many sorts (including wines and beer), seeds, grain, tobacco and wool.

Commodities shipped in barrels or casks may be wasted by starting of the staves under high temperatures.

Heat may cause or assist spontaneous combustion and in many cases spontaneous combustion is preceded by spontaneous heating which may cause damage to nearby goods. In carrying goods liable to spontaneous heating, care must be taken to see that there is adequate ventilation.

● Pilfering

This is one of the greatest sources of damage and loss of cargo. Nothing should interfere with the vigilance and care exerted to keep this loss at a minimum.

Foodstuffs, liquors and small articles of considerable value, such as clothing, instruments, tools and tobacco, are the articles most often molested. Automobile accessories and parts are often removed and should be carefully watched to prevent loss. Valuable goods shipped in paper containers that are easily opened should be given special stowage to protect them as much as is possible.

● Ventilation

Cargo may be damaged by lack of ventilation. A poorly ventilated hold is apt to become wet and warm and promote damage by moisture, heat odors, vapors and gases. Good ventilation which supplies a draft of air causes evaporation of excess moisture, lowers the temperature and removes foul air and gases.

Ventilation must be watched, and whenever it is possible the ventilator cowls should be trimmed to obtain the best flow of air through cargo spaces. However, care should be taken during rain or bad weather to see that water is not allowed to enter hold through the ventilators.

● Dangerous Cargo

Dangerous goods include all substances of an inflammable nature, which are liable to spontaneous combustion either in themselves or when stowed adjacent to other substances; also those commodities which give off inflammable gases and explosive gases, or produce gases or odors that contaminate foodstuffs. The three most common classes of goods considered dangerous are: (1) Goods liable to spontaneous combustion; (2) Malodorous goods; (3) Dust producing goods.

The commodities most liable to spontaneous combustion are: sawdust, cork dust, insulating material, leather, varnishes, lacquers, driers, disinfecting powders, oil cloth, matches, soda, burnt-lime, nitric acid, nitro compounds, sulphur compounds, fish guano, superphosphates, hay, clover, grass, malt, cereal grains, bran, hops, tobacco, seeds, wool, cotton, silk, flax, hemp jute, rope, oily rags and cloth. There are many other chemical compounds which are inflammable.

● Malodorous Goods

As a general rule only foodstuffs such as tea, coffee, flour, spices, cheese and wine are damaged by odors, but if the odor is strong enough many other items of cargo are liable to damage.

A partial list of commodities producing obnoxious odors include: tobacco, sponges, vinegar, sugar, naphtha, soaps, fertilizers, vegetables, fruits, nuts and grains. Those whose decomposition will result in evil odors include: among the vegetables especially, potatoes, onions, copra and rice; animal products of many sorts, particularly fish and fish compounds, dried beef, dried blood, green bones and hides; petroleum and coal products, such as oils, creosotes and coal tar; vegetable oils, gums and barks, such as camphor and turpentine; chemicals, especially carbides and sulphides, chloroform, iodine, phenol, strong acids, carbon, bisulphide, disinfectants such as formaldehyde and chloride of lime, chemicals emitting chloride and ammonia, and scents and spices, particularly musk, sumac and cinnamon.

The dust from some commodities damages other goods, and in all cases where dust producing cargo is loaded or discharged care should be used to prevent any damage to cargo stowed nearby. There are some dusts, such as coal dust and flour dust, which, under right conditions, are explosive dusts; also dusts which are highly explosive at all times, such as naphthalene dust.

Spunyarns and Catharpins

● nother Brain Twister

visitor to a lunatic asylum met a atient to whom he said, "Well, m good man, and how did you get in ere?"

he lunatic replied as follows:

Vell, sir, I married a widow, w a grown-up daughter, and then m father married that same step- daghter, and that made my wife th mother-in-law of her father-in- la and my father became my step- so Then my step-mother, the daghter of my wife, had a son, and th boy, of course, was my brother, be use he was my father's son, but he was also the son of my wife's st-daughter, and therefore he was m grandson, and that made me gr dfather to my own step-brother. Then my wife had a son, so my m her-in-law, the step-sister of my so is also his grandmother, be- ca e he is her step-son's child; my fa er is brother-in-law of my child, be use his step-sister is his wife; n the brother of my own son, wh is also son of my step-grand- m her; I am my mother's brother- in aw, my wife is her own child's aut, my son is my father's nephew, an I am my own grandfather. That is hy I am here, sir."

S. The visitor went goofy a days later trying to figure it all

—The Jungle Cat.

● ight Exaggeration

certain sergeant was accused of o g to a meeting, which his wife t nded against his will, dragging e from the hall, and forcing her o home with him.

e commanding officer requested the sergeant make an official v. It read:

n the first place, I never at- ted to influence my wife in her views, nor her choice of a meeting.

"In the second place, my wife did not attend the meeting in question.

"In the third place, I did not go to the meeting myself.

"In the fourth place, upon diligent inquiry, I am informed that no such meeting was held.

"Finally, I never had a wife.

"This report is probably not true."

—15th Inf. Sentinel.

● Nauticalities

When **Matthew Walker** put to sea
He hopelessly was lost
With sailors' terms, and so said he
To his messmate, **Samson Post:**

"Why should we have to **fish** and **cat**
An anchor in the **dog**?
Why put a **crowfoot** on a **mat**
With which we mean to **hog**?

"Why should the **ceiling** be the floor?
The **yard** be ninety feet?
Why should we have to stand before
A **sheepshank** we can't eat?

"Why should the **hounds** be on the mast,
Where **dogs** may never be?
Why should we say the ship is **fast,**
When stopped beside a quay?

"Why should we **box the compass** when
It's kept inside a box?
Why should we twist a yarn and then
Be told it is a **fox**?

"Why should the **tunnel** have no **rails**
On which to run a **truck**?
Why should we lower royal sails
And then say they are **struck**?

"Why **fiddle blocks** on **fife-rails** find?
Lizards on **leeches** see?
A **mouse** upon a **cat** hook bind?
Nettles in **garlands** be?

"Why should the bowsprit have a **bee**?
The ensign have a **fly**?
And why shou'd **wales** be in the sea
While **scotchmen** are on high?"

Old Samson Post said not a word,
For he was fairly beat,
So he **crowned** young Matt with a **matting sword**
And covered him with a **sheet.**

- C. L. in Nautical Magazine.

● A Trademark Brief

A Chicago lawyer was credited, in a bulletin issued a few years ago by the Chemical National Bank of New York, with a remarkable brief in a trademark case.

He made application for registration of the words "LIMESTONE BRAND" as a trademark for a cathartic medicine. Registration was denied on the ground that the medicine contained limestone. Mr. Rogers assured the department it contained no limestone. Then the application was again denied because such a trademark was "deceptive."

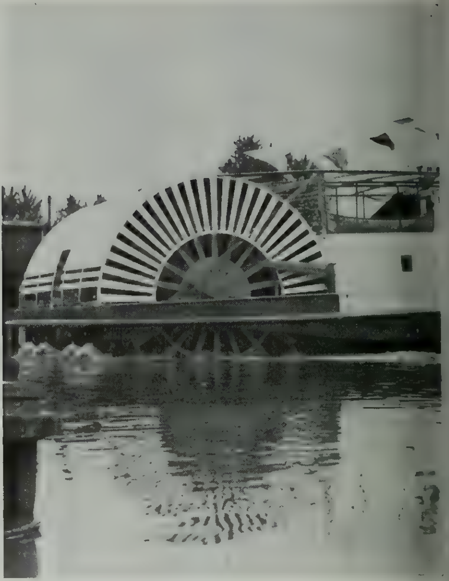
This stirred the lawyer to cite other trademarks which were equally deceptive, but granted by the department. We quote from this brief:

"Ivory is a good trademark for soap not made of ivory. Gold Dust washing powder is not made of gold Old Crow whiskey is not distilled from crows. There is no bull in Bull Durham. Royal Baking Powder is not used exclusively by royalty, nor is Cream Baking Powder made of cream. Pearline contains no pearls, and White Rock is not water."

Lest this should be insufficient to upset official stupidity, the lawyer added information of a collateral character, which has an interesting bearing on names of things. He continued:

"There is no cream in cream of tartar, in cold cream or in chocolate cream; no milk in milk of magnesia, in milkweed or in cocoanut. These are all as remote from the cow as the cowslip. There is no grape in the grapefruit or bread in the breadfruit. A pineapple is neither pine nor apple; an alligator pear is neither pear nor an alligator; and a sugar plum is not a plum. Applebutter is not butter. All the butter is taken out of buttermilk, and there is none in butternuts, or in buttercups, and the flies in the dairy are not butterflies."

An Unusual Shallow Draft Sternwheel Towboat



Launch of Jean, showing twin stern-wheels.

A sternwheeler constructed entirely of welded steel and embodying many new and novel features is the river towboat Jean, recently delivered to her owners, the Western Transportation Company of Portland, Oregon. Her design is the result of many years' experience in the handling of log booms and barges on the Columbia and Willamette Rivers, for which service the Jean was built.

This vessel and her engines were built by the Commercial Iron Works of Portland under the supervision of the designer, W. D. McLaren, naval architect for the owners.

Her principal dimensions are: length overall, 168 ft.; length between perpendiculars 140 ft., beam 40 ft., depth 8′ 3″, draft 6′ 3″.

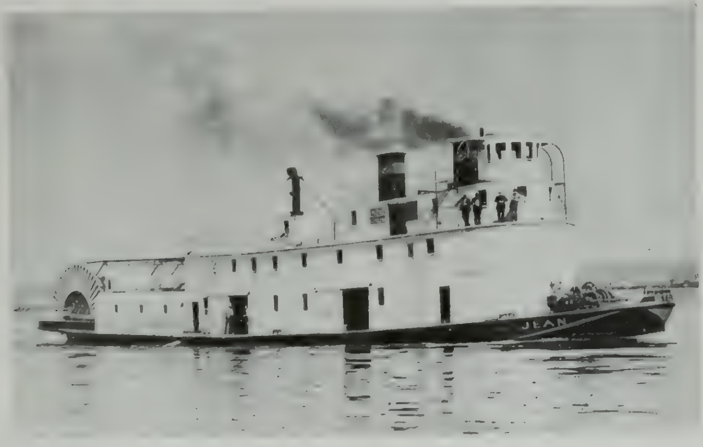
The hull and house are all steel, welded throughout. The framing is transverse, consisting of flat bars bracketed at the centerline and without floors. There is a continuous centerline bulkhead and wing lattice girders on each side. The house is two decks high with ⅛″ side plating lapped vertically. All steel was supplied by the U. S. Steel Corporation.

The frames and transverse bulkheads were shop welded and the entire structure, including deck plates, and coaming angles, assembled before any further welding was done. All inside tacking and welding was completed before starting on the outside. Intermittent and continuous beads were all step welded under close supervision in order t control and balance the heat.

This procedure practically eliminates any distortion of the structure. In the Jean seven 24-inch engine beams set on top of the after deck plating are used for engine foundations. The entire area covered by these beams (approximately 1000 sq. ft.) was within ¼″ of a plane surface.

In designing the steel deck house all seams of the light plating on the sides were made vertical. This feature, coupled with careful welding procedure, practically eliminates warping.

An outstanding feature is the us of twin stern wheels, each 20 ft in dia. and 13 ft. wide. This innovation was adopted to insure maneuverability and rapid handling in



Jean under way on the river.

the fast water of the upper Willamette and during freshets. Each wheel is independently driven by cross compounded engines. The high pressure cylinders have a bore of 8" and the low pressure 33" with a common stroke of 7 ft. Another feature of the engines is the all-steel welded pitmans. Eight rudders, four mains and four "monkeys" are used, operated by means of a steam steering engine. The auxiliaries and equipment of the engine room are of the most modern type. A steam engine driven generator of 15 k.w. capacity furnishes the power for lights, refrigeration, and ventilation fans. Control levers are grouped at the engineers' platform, and mechanical signal telegraphs as well as the complete gage board are conveniently located. Pressure lubrication to all working parts of the engine is provided by mechanical sight feed oilers.

Steam is furnished by two Foster Wheeler boilers equipped with superheaters. They will develop a total of 200 horsepower at 225 lbs. pressure and 375 degrees of superheat. Three Coen oil burners on each boiler are used, and forced draft is furnished by a steam turbine fan located in the boiler flat. Fuel oil is heated for these burners by a Coen fuel oil heater, and is pumped to the burners by Dean pumps.

Worthington Pump and Machinery Corporation supplied the feed water pumps and the bilge and general service pump.

The main oil tank extends vertically from the boiler flat to the top of the main deck house and forms the forward bulkhead of the house. This tank has a capacity of 650 bbls., and in addition two reserve tanks are located in the hull, each having a capacity of 60 bbls.

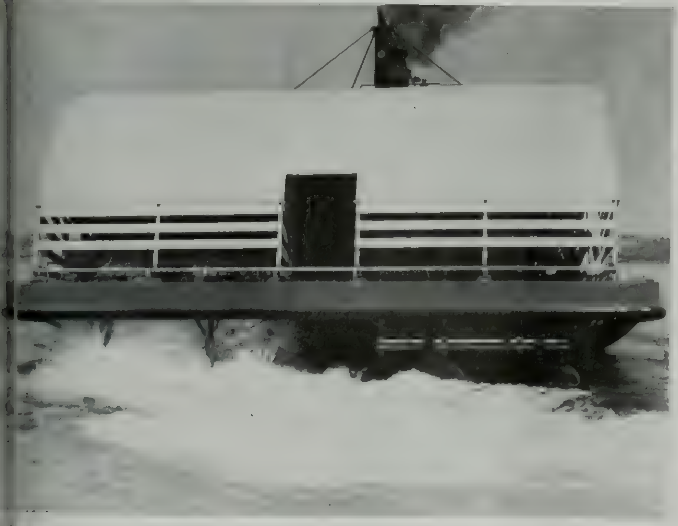
On the main deck are located the engineers' and crew's quarters, as well as the galley and salon. The galley is equipped with an Ingle oil burning range and a 35 cu. ft. electric refrigerator. Sink and dressers are of stainless steel. Each man in the crew is provided with a separate room with spring bunks, mattresses, large closet, wash basin, and berth light. Accommodations are provided for 12 men on this deck. Shower and toilet facilities are conveniently located here also. All lighting circuits and fixtures were supplied by the Marine Electric Company.

The upper deck has similar quarters for the captain and pilot, and above this is located the pilot house with flying bridge. Two 18" searchlights are provided on top of the house. All necessary aids to navigation, including compass, intercommunicating phone system, etc., are provided.

The main towing engine was supplied by the Markey Machinery Company and is located on the engine deck and the line is led up through a hollow steel towing post to a roller bearing mounted swivel head. A steam winch is provided on the deck at the bow.

The Jean was launched May 7 with appropriate ceremony and the sponsor was Miss Jean Naomi Seid of San Francisco. The final acceptance trial was held June 4 and about eighty persons were aboard. The boat's performance during the trials came up to expectations in every respect.

The Western Transportation Company, L. R. Gault, manager, is an affiliation of the Crown Willamette Paper Company and operates the largest fleet on the river. Besides the Jean, the Commercial Iron Works has built for them eight steel welded barges each of 700-ton capacity and three small diesel towboats, also of steel, welded.



Stern view of Jean with rudders set for right turn and left wheel going full speed ahead with right wheel held steady.

March of Time Features Coast Guard

The protection afforded U. S. life and property on the seas by vigilant patrol of the U. S. Coast Guard forms the basis of the new issue of the motion picture March of Time, entitled "U. S. Coast Guard." The film shows how Coast Guard ships and planes patrol the maritime borders of the United States, why the Coast Guard has been chosen as International Ice Patrol by the principal maritime nations of the world.

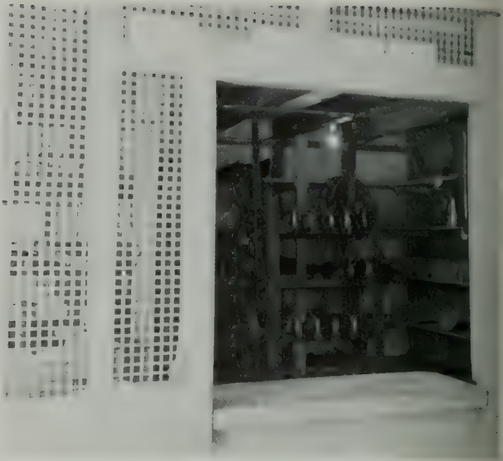
Sequences in the film portray the Coast Guard lending assistance to disabled ships, the transferal of a dangerously ill seaman from ship to Coast Guard plane, to be taken to the nearest medical aid station, and other such duties.

Permission to make the film was granted March of Time's producer, Louis de Rochemont, by Rear Admiral Russell Randolph Waesch, who also authorized officers and enlisted men to take part in the picture.

NEW

Plate Shop

At San Francisco Works of General Engineering & Dry Dock Co.



The Tool Room Issuing Door.

General Engineering & Dry Dock Co. for the past year or more has been very effectively reconditioning its marine repair and general engineering shops at San Francisco. The latest addition is the transformation of the original shop on Battery Street into a modern plate shop designed especially to expedite hull repairs and alterations that can be performed without docking and while the ship is loading or discharging at her pier.

The shop structure is of brick with steel trusses and a metal roof amply skylighted for complete natural illumination. It covers a floor area of 60 feet by 120 feet and extends through from Battery Street to Gaines Street, giving a clear drive for trucks right through the shop.

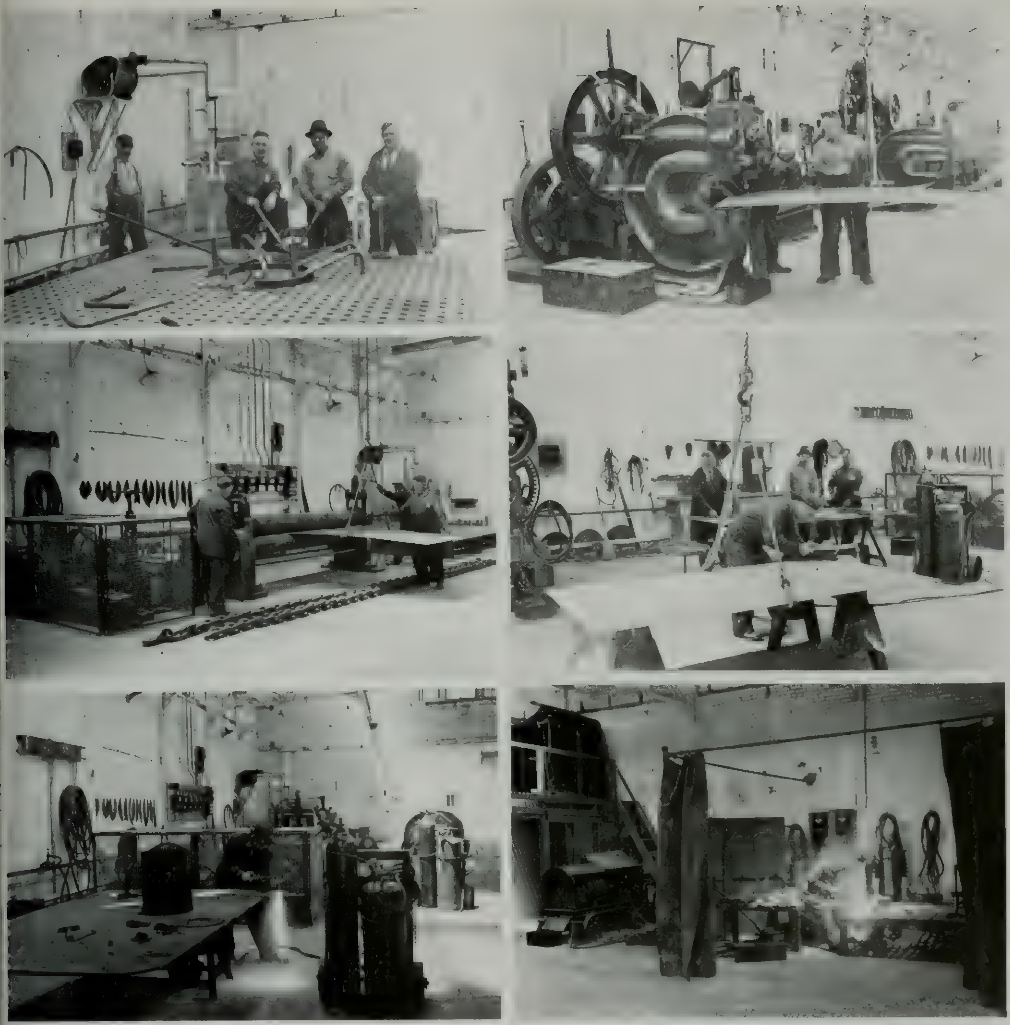
The photographic reproductions bring out distinctly the character of the lighting effect gained by the many skylights in the roof. This even distribution of light is naturally of a degree of importance second only to the mechanical equipment itself as a factor in the handling of work with economy and dispatch.

A ten-ton crane of 35-foot span serves the plate shop, and in addition there are two floating travelers of 40-foot span with hoists for convenient moving of materials about the shop and in and out of the tools. Shears, rolls and all other machines are individually motorized. The tool room (shown in the illustration in the heading of this article) is equipped with chipping guns, riveting guns, dollies, air drills and all other tools required for ship repair operations. Acetylene welding and cutting apparatus is available throughout the plant and a fully equipped electric welding department forms another important feature.

A new gas fired furnace is located conveniently to the bending slab. This unit is 18 inches by 18 inches by 6 feet deep and is capable of maintaining a temperature of 1900° F. The bending slab is 14 feet square and is supported above the floor level at a suitable height for all classes of work.

The bending rolls are driven by a 40 horsepower motor with variable speed reversing control through multiple Vee belt transmission and

General view of the interior of the new plate shop at the San Francisco Works of the General Engineering & Dry Dock Co.



SIX PICTURES IN THE NEW PLATE SHOP

Upper left: Bending slab with furnace at rear.
Center left: Bending rolls (note strong wire guard around gearing).
Lower left: Flame cutting (note portable oxy-acetylene units).
Upper right: Battery of punching machines.
Center right: Laying out plate work and flame cutting.
Lower right: Welding booth and slab.

uction gears enclosed in a heavy
e cage. These rolls will handle
es up to 1 inch in thickness and
eet in width.

he shop is amply equipped for
ne cutting and welding opera-
s either with electric arc or by acetylene torch. A heavy 8 foot by 10 foot welding slab is installed and a number of portable acetylene cutting and welding units equipped with Stuart oxygen tanks. The electric welding generator and controls are Westinghouse.

The completion of this fine shop will enable General Engineering & Dry Dock Co. to render more efficient and speedier service in emergency hull repairs and hull alterations on the San Francisco waterfront.

On the Ways -

SHIPS IN THE MAKING

LATEST NEWS FROM AMERICAN SHIPYARDS

American Shipbuilding and Marine Engineering Contracts

American Locomotive Company about July 1 was awarded a contract by the Navy Department in the amount of $1,746,000 for the furnishing of propulsion machinery for the new submarine tender No. 11.

The General Motors Corporation was awarded a contract by the Navy Department in the amount of $2,583,000 for furnishing propulsion machinery for the three submarines 198, 199 and 200, building at New London, Conn. General Electric Co. electrical equipment is to be used.

Fairbanks, Morse & Co. was awarded a contract by the Navy Department in the amount of $2,880,801 for 3 sets of propulsion machinery for the submarines 201, 202 and 203. Two of these boats are to be built at Portsmouth, N. H., navy yard and the other at Mare Island, California. General Electric Co. electrical equipment is to be used.

Electric Boat Company, Groton, Conn., was the only bidder on the three submarines Nos. 198, 199 and 200. This firm will build these underwater boats at $3,407,000 each, with deliveries at 29, 31 and 3 months.

Mrs. Edward L. Shea, wife of the executive vice president of the Tide Water Associated Oil Company, ready to sponsor the 13,000 ton tanker Associated June 9, 1938.

Western Pipe and Steel Company, San Francisco, was awarded a contract by the U. S. Engineers Office for the construction of two 500 cubic yard steel dump scows at a total cost of $199,000.

Recent Deliveries from American Shipyards

American Shipbuilding Company. On June 8 and June 18, respectively the American Shipbuilding Company delivered to the Pittsburgh Steamship Company two notable bulk freighters of the Great Lakes type, the William A. Irwin and the Governor Miller.

Each of these ships is 610 feet in length, 60 feet in beam and 32′ 6″ in depth, and is powered with a 200 shaft horsepower geared steam turbine supplied with steam at 40 pounds pressure by two water tube boilers. Auxiliary machinery is electrically operated.

Jakobson & Peterson, New York during June and July delivered an 84 foot all welded steel tug and a 70 foot all welded steel auxiliary yawl.

Electric Boat Corporation during July completed the submarine Skipjack for the U. S. Navy Department

The Pusey and Jones Corp. on June 23 delivered the cargo vessel Quaker to the Philadelphia and Norfolk Steamship Company and delivered Cavalier, a sister ship, during

Now Using the Oil

"THAT TALKS BACK TO A TURBINE"

In fast moving turbines, temperatures go *way* up—and stay there! Yes sir, it takes a mighty tough oil to stand up and "talk right back to a turbine."

Marine engineers tell us Shell Marine Janus Oil is the one that'll do this. It's *just that tough!* The meanest kind of going won't break it down. And it's free of the impurities that help cause sludge and clog oil passages.

Coastwise Line has just adopted Shell Marine Janus Oils in the *Coast Trader, Coast Merchant,* and *Coast Farmer.* Shell invites you to ask them about the service these real tough oils are giving.

Among operators of all types of vessels—large and small—you'll find enthusiastic users of Shell marine products. They do a money-saving job because they are marine engineered. Behind them all are Shell's world-wide research facilities—and Shell's years of marine experience.

For further information on the complete Shell line, call your nearest Shell office. Or write Industrial Lubricants Division, Shell Building, San Francisco, California.

For Diesel Engines

Shell Marine Argus Oil will not carbonize and cause sticking rings. Nor will it sludge up and clog oil passages. And it's tough enough to stand up under the greatest heat and pressures in a Diesel.

For Reciprocating Engines

Shell Marine Marica Oil insures proper lubrication for reciprocating steam marine engines. It flows freely. Does not "gum up" wicks. Will not wash off rubbing surfaces. Available in correct grades and amounts of compounding for all bearing requirements.

SHELL MARINE PRODUCTS

When Mrs. Robert H. Colley, wife of the president of Atlantic Refining Company, christens a tanker for her husband that tanker knows it's christened. At right, John G. Pew, president, Sun Shipbuilding and Dry Dock Company, builders of the vessel.

the latter part of July. These are two very neat and up-to-date vessels for coastwise service. With a length of 292 feet, a beam of 48 feet 6 inches, a depth of 32 feet 3 inches, and a draft of 18 feet 6 inches, each is propelled by a single screw driven by a double reduction gear cross compound 4000 shaft horsepower turbine deriving steam from 2 water tube boilers. These hulls have a loaded displacement of 4215 tons and a deadweight capacity of 2050 tons. Their service speed is 16½ knots. They will be capable of maintaining 17½ knots when necessary, as is shown by the fact that on the trials a speed of 19 knots was attained.

The two ships are replacing four of the old "Lake" type freighters on the overnight run between Philadelphia and Norfolk.

Sun Shipbuilding and Dry Dock Company delivered during June one 18,360 deadweight ton diesel motor tanker to their own stock account and one 12,700 deadweight ton tanker, the Associated, to the Tide Water Associated Oil Company. On August 6 this firm expects to deliver to the Atlantic Refining Company the 18,500 deadweight ton tanker Robert H. Colley, a turbo electric drive tanker, sister to the J. W. Van Dyke, world's largest welded ship.

Recent Launchings at American Shipyards

Robert H. Colley, the largest commercial hull launched this year in an American shipyard, slid down the ways at the Sun Shipbuilding and Dry Dock Company July 9 after being soundly (see picture) christened by Mrs. R. H. Colley, wife of the president of The Atlantic Refining Company, for whom this ship was named.

A turbo-electric drive 18,500 deadweight ton tanker, this vessel and her sister ship, the J. W. Van Dyke, are the world's largest welded ships.

Robert H. Colley, whose name the new ship bears, entered the employ of The Atlantic Refining Company in 1919. He was elected treasurer and a director of the company in 1929. Elected a vice president of the company in 1936, his election as president took place on May 4, 1937. During the World War he served as an artillery officer with the U. S. Army in France.

Esso Charleston, last of four 13,000 deadweight ton tankers building at the Sparrows Point Plant of the Bethlehem Shipbuilding Corporation Ltd. for the Standard Oil Company of New Jersey, was launched July 23.

A New York City fireboat was launched July 28 at the Staten Island Plant of the Bethlehem Shipbuilding Corporation Ltd. This ship, 134 feet long, 32 feet beam, and 13 feet 3 inches depth of hull, will be equipped with the most modern and powerful pumps and fire fighting apparatus.

Pan-Maryland. On July 23 at 5:30 P. M. occurred another "big splash" at the Federal Shipbuilding and Dry Dock Company, Kearny, N. J., when another big tanker for Pan American Petroleum and Transport Company slid down the ways before some two thousand guests.

This one was christened Pan-Maryland by Mrs. Chas. H. Wagner, wife of the general manager of the American Oil Company, a subsidiary of Pan American Petroleum and Transport Co.

Trade Notes

Caterpillar Tractor Co. announces the appointment of **Thomas A. Short,** widely known marine sales engineer, as representative for Caterpillar marine diesel propulsion units and marine diesel auxiliary power units.

The Thomas A. Short Company is located in the Fife Building, 1 Drumm Street, San Francisco. Phone Sutter 7622.

Atlas Imperial Diesel Engine Company has opened a Central Division Sales Office in the Builders Exchange, 228 North LaSalle Street Chicago, Illinois. F. H. Kilberry president of this firm, recently returned from the Mid-West metropolis after starting the new office.

In charge at Chicago will be F. H Dickson, assisted by A. H. Braunsdorff and A. A. Bauer. J. R. Watson will also make his headquarters at the Chicago office and will specialize in the introduction of the "Atlasco" electric fuel injection system.

General Engineering & Dry Dock Co. reports good progress in the sal of "Genco" lifeboat winches, both o the Pacific Coast and on the Atlantic seaboard.

Dependable Insurance Since 1863

Fire · Automobile · Marine · Casualty · Fidelity · Surety

FIREMAN'S FUND GROUP

Fireman's Fund Insurance Company — Occidental Insurance Company
Home Fire & Marine Insurance Company
Fireman's Fund Indemnity Company — Occidental Indemnity Company

Strength Permanence Stability

New York · Chicago · SAN FRANCISCO · Boston · Atlanta

Emergency Loudspeaker Systems

By F. C. Hoelzle

Principal Electrical Engineer, Bureau of Marine Inspection and Navigation

he difficult problem of leader- p during times of emergency at has long been faced by officers passenger vessels. This has been ognized by this Bureau for many rs and the public also has be- me more or less conscious of the blem. It has become, in the past years, the subject of intensive earch with a view to relieving the iation from the standpoint of the cers, to provide better coordina- of the efforts of the crew, and ontrol and reassure the passen- s. One of the methods developed put in operation during the past r was a means of communicating h all parts of the ship by a loud aker system.

n order that the officer on the lge may control the issuing of ers to the crew, the concentra- of passengers, the handling of boats, and the embarkation of sengers into the lifeboats, the reau has required that an emer- cy loudspeaker system be in- led on passenger vessels in those es where the lifeboats are stowed roximately 100 feet or more from navigating bridge.

he emergency loudspeaker sys- s approved by the Bureau are igned to operate successfully ler the most adverse conditions; hort circuit or ground will not ously affect more than one aker and continued operation is sible under a wide variation of voltage supply. In the design of the component parts of the system, special consideration has been given to their ruggedness and reliability against the action of salt water, corrosion, shock, changes in temperature, and other conditions encountered aboard ship.

After careful study it was decided that the central control station should be in the pilot house and that the following sections of the vessel should be covered by sound:

The first circuit is the quarters of the bedroom stewards, the deck crew assigned to lifeboats and the emergency squad. By means of this circuit the crew can be given the necessary preliminary instruction.

The second circuit serves the boat deck and enables the officer of the deck to supervise the handling of the lifeboats.

The third circuit covers the deck from which the passengers will embark into the lifeboats, thus aiding the officers in assembling the passengers at the correct stations.

Both the deck circuit and the embarkation deck circuit are divided into a port and a starboard individually controlled circuit with one or more two-way conversation stations in each circuit. This gives two or more talk-back stations on both the boat and embarkation decks.

Thus, orders may be issued from the bridge to the starboard boat deck, port boat deck, starboard embarkation deck, etc., or to a combination of these locations. An indicating light located on the control panel indicates to the person broadcasting that a two-way speaker desires conversation with the pilot house. Conversation cannot be held, however, until a switch-on control panel is thrown to the listen position, thus preventing one or more of the two-way conversation speakers trying to talk to the pilot house at the same time.

As a loudspeaker system of this type had not been developed for marine use, considerable research was necessary before detailed specifications could be given to the various manufacturers.

First, a satisfactory decibel output for the speakers was necessary. After extensive investigations, including tests conducted on the S. S. Colombia at sea, a voice level of 95 decibels for outside speakers and a voice level of 72 decibels for inside speakers was found to give the desired results. Next, a speaker capable of giving the specified output without requiring excessive power had to be developed. The products of various manufacturers were tested and, after alterations were made to eliminate deficiencies noted by the Bureau, one outside speaker and several interior speakers were approved.

Marine Insurance in All Phases — "All Risks" . . . Inland Marine . . . Ocean Marine

STANDARD MARINE INSURANCE COMPANY, LIMITED
NATIONAL UNION FIRE INSURANCE COMPANY
MERCANTILE INSURANCE COMPANY OF AMERICA

GEO. E. BILLINGS CO.

Pacific Coast General Agents—Richard J. Lutich, Marine Manager

GArfield 3646
308 California St.
SAN FRANCISCO

TRinity 1521
Spreckels Bldg.
LOS ANGELES

SEneca 1478
Colman Bldg.
SEATTLE

MARINE DEPARTMENT
AETNA INSURANCE CO.
QUEEN INSURANCE CO.
MARITIME INSURANCE CO., LTD.
FIDELITY PHENIX FIRE INS. CO.
Commercial Hull Dept.
AUTOMOBILE INS. CO.

Mathews & Livingston

Marine Underwriters
200 BUSH ST. SAN FRANCISCO
Offices at: Colman Bldg. - Seattle 111 West 7th St. - Los Angeles

Complete emergency loudspeaker systems were then set up by the manufacturers at the National Bureau of Standards and given extensive tests by their personnel as well as that of the Bureau. Five systems were given preliminary approval as a result of these tests. In all cases final approval of each installation is to be given only after service tests are made on board the vessel.

At the present time installations made by all of the five approved manufacturers have been tested and accepted by the Bureau.

The Bureau has been ably assisted in the development of the emergency loudspeaker systems by the sound section of the National Bureau of Standards, whose technical knowledge and laboratory facilities have been at the disposal of the Bureau.

While, of course, the Bureau is taking every precaution to eliminate the possibilitiy of any emergency at sea, it is the opinion that the loudspeaker system will prove its worth if an emergency does arise.

Bureau of Marine Inspection and Navigation "Bulletin."

Some Safety Belts

Some time ago two taxis collided in Glasgow and seventeen passengers were injured.

And the oil man, who recently grabbed the radiator cap to stop a runaway truck, will recover.

But the classic safety story of all time is that one about the machinist who had a finger cut off with a circular saw. Following the accident, the safety committee made an investigation of the affair right on the spot. They were all gathered around the saw, and the safety supervisor started the proceedings by asking the victim to explain exactly how it happened. "Well," he said, "to tell you the truth, I can't tell you much about it. I was just standing here and I put my hand up like this, and . . . shucks, there goes another one."

Recent Changes of Masters

Marine Exchange, San Francisco

Steamer El Segundo: Rudolph Weishaar; vice, Arthur W. W. Markley.
Steamer Mericos H. Whittier: B. B. MacDonald; vice, Oliver H. Pitts.
Steamer General M. H. Sherman: C. W. Saunders, Jr.; vice, C. N. Olsen.
Steamer Makua: H. O. Pennoyer; vice, C. W. Saunders, Jr.
Steamer Alabaman: E. J. Anderson; vice, O. L. Thomson.
Steamer Tulsagas: Maurits M. Melan; vice, Robert W. Kelly.
Steamer Georgian: F. J. Butler; vice, B. Leep.
Steamer D. G. Scofield: Arthur W. W. Markley; vice, H. O. Bleumchem.
Steamer Point Clear: E. H. Phillips; vice, H. O. Odeen.
Steamer Hamakua: Carl H. Olson; vice, J. H. Berndsen.
Steamer J. C. Fitzsimmons: S. S. Dunnell; vice, J. S. Christenson
Steamer Lurline: K. Hubbenette; vice, C. A. Berndtson.
Steamer Columbian: H. B. Hansen; vice, O. Lee.
Steamer Arkansan: R. A. Oliver; vice, P. A. Jones.
Steamer President Adams: G. Cullen; vice, H. S. Bauer.
Steamer Munami: C. F. Wifstraud; vice, A. T. Swanson.
Steamer Malama: W. A. Shea; vice, M. Vick.

Running Lights of Pacific Shipping

V. H. MAYBAUM

V. H. Maybaum, Pacific Coast passenger traffic manager of Panama Pacific Line, headquartered at San Francisco, has been with I. M. M. since 1911 . . . (the year he got his first job), passenger department in Cleveland for 3 years, Southwestern district P. M. in St. Louis 3 years, G.P. A. in charge of agency department for 8 years in New York, thence to Los Angeles as G. P. A. Took time out during big war to soldier with famous 105th Field Artillery (27th Division, New York). He was vice chairman of transportation of American Olympic Committee and personally conducted the team to Berlin in '36. He plays the Culbertson system—and expertly. He shoots "under a hundred." A glorious baritone voice has kept his evenings occupied . . . with the Orpheus Male Chorus . . . with the Apollo Club . . . and there's been an occasional "bit of radio on the side." A [illegible] personality, San Francisco has already adopted him!

BERNARD MILLS

It is with pride that we present **Bernard Mills,** Superintending Engineer of the big 38-vessel American-Hawaiian fleet, he will round out 38 years with A-H in November. Ahead of joining this intercoastal line . . . in Auxiliary Navy Service—Spanish-American War . . . with U. S. Army Transport Service. In 1900 the A-H fleet was the Californian, built by Union in S. F. . . . the American, the Oregonian and the Hawaiian products of the Roach yard on the Delaware. Mr. Mills, considered the Dean of Marine Engineering on the Coast, supervises A-H engine performances at Pier 28 on the Embarcadero. A resident of Danville, he grows walnuts and almonds. He's a seasoned commuter, motors daily through the new tunnel to the Key train in Berkeley. Mrs. Mills and two grown youngsters are "all well and happy!"

V. W. HOXIE

V. W. Hoxie, Babcock & Wilcox marine boiler authority with Chas. C. Moore & Company, Engineers at San Francisco. "Joe," as a host of loyal friends hail him, has steamed up many a power plant over the past 40 years! And he's witnessed some remarkable trends in marine engineering. Born in San Rafael. He rounded out his technical education back at Stevens Inst. of Technology . . . returning to S. F. in '97.

Hobbies? Well—if you'd call grape-growing to the tune of twelve carloads annually a hobby—he's got one! The vineyard is at Lodi, where Joe and his "pal," Mrs. Hoxie, have a grand ranch house for their weekends and vacations . . . (and friends!)

Member of the A. S. M. E. since 1915 . . . and of the Society of N. A. M. E. since '24; he has countless friends on both coasts and his Eastern visits are great reunions of maritime notables. A B. & W. man since 1898.

Names and News

On Monday, June 6, the board of directors of the United Fruit Company elected **H. H. Robson,** vice president of the United Fruit Company in charge of steamship and piers operations, a director. He has been connected with the United Fruit Company for the last 17 years. He was an engineer in the Great White Fleet, then assistant port engineer, then port engineer. His knowledge of steamship operations obtained further recognition when he became assistant superintending engineer and from there rose to superintending engineer. Mr. Robson's next step forward was to be engineer of the Marine Department, then to assistant vice president of transportation and now vice president in charge of steamships and piers operations. His entrance into the board of directors is a further tribute to his ability and knowledge.

**H. H. Robson
of United Fruit**

Mr. Robson is a native of Australia and graduated from Canterbury, New Zealand. He saw war service in the British Navy from 1914 to 1920, joining the United Fruit Company in that year.

On July 15 **Capt. Henry Gleason** addressed the Keel Club of the school ship California State at a meeting held at the St. Julien Restaurant. He spoke on the topic "Marine Legislation."

P. P. Mesquita, secretary-treasurer of General Engineering & Dry Dock Co., has been appointed by Mayor W. J. McCracken of Oakland as a member of the Playground and Recreation Board for a term of six years.

Dan Dobler, marine superintendent of The Texas Co. at Los Angeles Harbor, announces that **Clarence Peterson** is to be chief engineer of the new Texas tanker Connecticut, now building at the Sparrows Point plant of the Bethlehem Shipbuilding Corporation, Ltd. Connecticut will be launched during August and delivered shortly thereafter.

S. G. Walton
Matson G. P. A.

Sidney G. Walton, secretary of Matson Navigation Company, has succeeded the late J. E. Ryan as general passenger agent of the company. His duties include those of coordinator to see that things in the organization run smoothly.

Todd Shipyards Corporation announces that at the annual meeting held on June 1 at 1 Broadway, New York City, **Francis J. Gilbride,** vice-president of Robins Dry Dock & Repair Company, and **David H. Lanman,** president of Brooklyn Savings Bank, were reelected directors for a term of four years.

Announcement has been made by **George V. Cooley,** district manager of American-Hawaiian, of the appointment of **Henry W. Frick** as general freight agent in charge of eastbound traffic. Mr. Frick fills the vacancy created by the recent death of Charles Gay. His former post as district freight agent in charge of westbound traffic has been filled by **Ralph Hewett** of the purchasing department.

P. P. L. Personnel Changes

Kenneth D. Dawson, vice president in charge of Pacific Coast operations for the United States Lines Company has announced complete reorganization of the passenger, freight and operating departments in connection with the inauguration of the new Panama Pacific Line Intercoastal Service.

At San Francisco

R. J. Ringwood, Pacific Coast freight traffic manager, assisted by **C. M. Cox,** general freight agent. The following assistant general freight agents have been appointed **A. M. Davis, G. R. Page, J. W. Willis, B. S. Richmond, Arthur White** and **N. V. Montano,** the last named being traveling freight agent. Arthur White was former traffic manager of The Emporium and former president of the Western Traffic Association. B. S. Richmond was formerly connected with Grace Line.

In charge of operations, **Captain Vance D. Trout.**

W. H. Maybaum, as Pacific Coast passenger traffic manager, recently succeeded **L. E. Archer,** retired. Assisting Mr. Maybaum will be **Charles M. Wagner,** chief clerk, and **H. W. Smith,** in charge of Panama Pacific Line bookings, and **H. R. Cawsey,** in charge of United States' Lines bookings.

At Los Angeles

Hugh Middleton, general freight agent and **G. H. Nickerson,** as general passenger agent.

At Seattle

A. H. Beisel, general freight and passenger agent.

At Oakland

J. E. Tuft, assistant general freight agent.

The Coastwise Line will act as agents for the Panama Pacific Line at Portland and Columbia River points.

Mr. Dawson expressed himself as being very well pleased with the response which has been received in connection with the announcement of the new Panama Pacific Line service being inaugurated with the sailing of the S. S. City of Los Angeles from New York August 6 and from San Francisco August 26 and weekly thereafter.

ubbs Cordage Sluggers

henomenally successful is the ly-formed baseball team of Tubbs Cordage Company, San Fran- co rope manufacturing firm. Or- ized only last year, the Tubbs n is fighting for top honors in Bay area soft-ball leagues, the position League and the San ncisco Recreation League. Play- in the Exposition League are ns of Hills Brothers Coffee, En- ope Corporation, Ecklund Auto ts, Federal Motor Sales and Col- Motor Sales, as well as the bs team, which is now just one e behind the leader with four es yet to play. Speed is the bs specialty, both in ball han- g and base running. It has kept n out in front so far this season the San Francisco Recreation gue, where they are undefeated r two starts.

n the picture are Jerry Favero, Dispensa, Bob Lane, Alex soff, Jas. Burns, Al Vickers, La Grande, Chuck De Lilio, Sciume, Mario Muzio, Jas. Wall, De Rita, Tony Catalano, Pete odi.

. N. PETERSON

ith Alaska travel at its peak, H. Peterson, general passenger nt for the Alaska Steamship pany, is sponsoring two organ- ons into which tourists from ous parts of the country are in- ed during their cruises in Alas- vaters.

hose who voyage beyond Lati- 54 degrees become "Knights of Midnight Sun" while those who de the Far North are initiated the "Honorary Order of Arctic enturers." Certificates printed in rs and suitable for framing are n both groups.

Knights of the Midnight Sun" given testimonials, signed by the ter of the ship, while the parch- t certificate issued to members he "Honorary Order of Arctic enturers," is signed by "Polaris tunus Rex, ruler of the Polar ," the commander of the vessel the "Polar Scribe to His Maj- ."

The steamship Denali will make the annual cruise of the Alaska Steamship Company to the Arctic this year, sailing from Seattle August 16 and returning to that port September 10.

Maurice Asher has announced the removal of his law offices to Suite 1607, Central Tower, 703 Market Street, San Francisco. Mr. Asher is well known in Coast marine circles. Years ago he was secretary to the late Joseph J. Tynan at Bethlehem, San Francisco.

HERBERT SEEBOHM

Leaving San Francisco recently, Herbert Seebohm, district manager of the Swedish-American Line here, has gone to New York, where he will embark on the Gripsholm for a cruise to the Vikinglands, Estonia, Finland and Russia.

Mayson White Torbet has been appointed chief engineer of the Davis Engineering Corporation, Elizabeth, New Jersey. Mr. Torbet was formrely chief engineer of United Shipyards, Inc., Staten Island Plant. Prior to his association with United he served as assistant general manager and chief engineer of the New York Shipbuilding Corporation, Camden, New Jersey.

ADMIRAL LAND TO ACT AS CHAIRMAN OF INTERNATIONAL LIFEBOAT RACE SEPT. 10

Rear Admiral Emory S. Land, chairman of the United States Maritime Commission, will act as chairman of the Twelfth International Lifeboat Race in the Narrows on Saturday afternoon, September 10, in which crews of various nationalities representing lines serving New York will compete for the championship of the world, it was announced recently.

Rear Admiral R. R. Waesche, commandant of the United States Coast Guard, will act as judge, it was also announced at a meeting of the International Lifeboat Racing Association, Inc., at the Downtown Athletic Club, attended by shipping executives. **E. P. Rees,** general manager of Furness Withy & Co., Ltd., presided as president of the association.

Details of the Capsize Race, a novelty in this year's program which will be a preliminary to the lifeboat race, were explained by Captain Ralph Dempwolf, recently appointed commander of the New York division of the United States Coast Guard.

Ten crews of Coast Guard stalwarts will compete in this race, which will be over a mile course and in which each crew will have to turn their boat completely over and right it when they come to a flag near the finish line. Boats used in this race will be the Coast Guards' self-righting and self-bailing surf boats. To capsize the boat the men must stand on the gunnels tugging at lanyards attached to the other side until the big boat (1600 pounds) goes over. The men are thrown into the water, swim under the boat and right it by treading water and lifting the other side.

The winning crew of the Lifeboat Race, main event of the day, will be given temporary custody of the Joseph W. Powell Trophy, one leg of which is held by a lifeboat crew of the S. S. San Jose of the United Fruit Company. The cup becomes the permanent possession of the crew winning three times.

The present world champions of lifeboat racing are a lifeboat crew of the S. S. Conte di Savoia. **I. E. Verrando,** general manager of the Italian Line in the United States, pledged that the Italian contenders would be in this year's race to defend their title.

The lines will be allowed to start their crews in training on August 10. Standard United States Coast Guard lifeboats will be used in the race and through special permission from the head of the Coast Guard in Washington foreign lines will be permitted to take Coast Guard boats to European harbors for the training period.

Among those attending were: **J. J. Kelleher; Captain L. LeFriant; Ira A. Campbell; Hans C. Henricksen; Willard F. Jones; Captain C. C. Baldwin; Paul Revere Smith; John Sirignano; Captain H. N. McDougall;** and **Commander J. S. Baylis** and **Lieutenant P. D. Mills,** both of the United States Coast Guard.

WILLIAM DONOVAN

In Aberdeen, Washington, William Donovan, president of the Donovan Lumber Company, passed away recently. He was a pioneer in the lumbering industry on the Coast, coming from Minnesota and Wisconsin many years ago and forming a partnership with the father of Ralph W. Myers, president of the Shipowners Association of the Pacific Coast. He was 84 years of age.

Necrology

Pacific Coast shipping was recently bereft of one of its most outstanding personalities with the death of **John E. Ryan,** general passenger manager of the Matson Steamship Company and vice president of its affiliate, the Oceanic Steamship Company. Mr. Ryan died June 30 at Altadena, where he had moved but a short time before because of ill health.

Mr. Ryan first became associated with the Matson Line as a statistician in 1920, after having been identified with three railroads, the Pennsylvania, the Colorado and Southern at Denver, and finally with the Southern Pacific in California. His appointment as general passenger manager of the Matson Line followed a successful record made as efficiency expert in charge of reorganizing several departments of the company in order to meet changing conditions in shipping.

Shortly after his appointment three new ships, the Mariposa, Monterey and Lurline, were added to the Matson fleet and Mr. Ryan's activities became centered on the development of traffic to New Zealand and Australia as well as on the expansion of travel to Hawaii. One of the greatest opportunities lay in diverting travel between England and the Antipodes to the Matson Line and across the United States. In furtherance of this, Mr. Ryan went to England to establish an office of the Matson Line in London and also made an extensive trip through Australasia.

A rapid growth in both Hawaiian and South Sea business ensued, the company enjoying the most prosperous period in its history. In recognition of his successful efforts, Mr. Ryan was last year named vice president of the Oceanic Steamship Company.

Mr. Ryan, long a resident of San Francisco, was born May 16, 1883, in Pittsburgh. He is survived by his wife and two children.

John E. Ryan

CHARLES GAY

It is with regret that we learned of the death of Charles Gay on June 22, which was occasioned by heart failure. Mr. Gay was general freight agent in San Francisco for American Hawaiian Steamship Company, having been a member of the company's shore personnel for the past seventeen years. He was very popular both in San Francisco and in the San Jose territory, the latter having been his especial province.

VICTOR M. SMITH

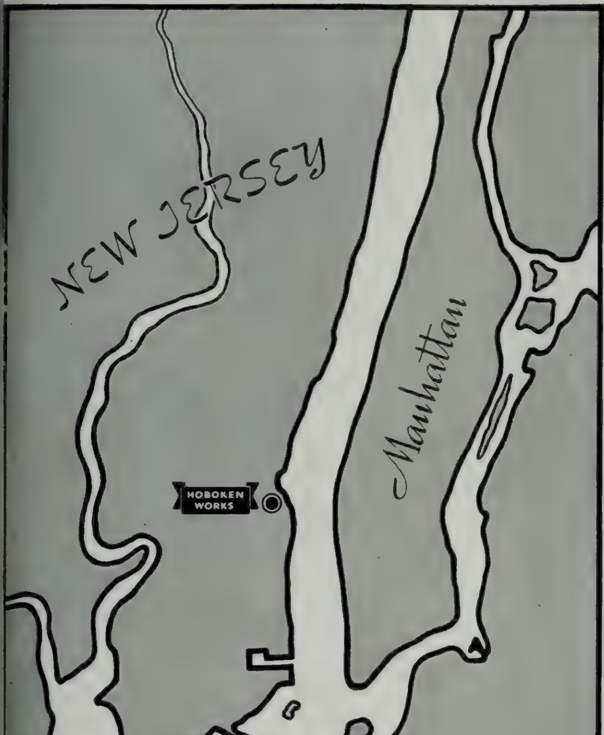
Another shipping executive to pass away in June was Victor M. Smith, at one time assistant general manager in the Orient for the United States Shipping Board. He also served as representative of the Dollar Line in the Orient, as well as in industrial traffic management capacities. Mr. Smith was retired at the time of his death.

JOHN A. STROMBERG

After an illness of two years, John August Stromberg, retired marine engineer, passed away in Seattle in July. He went to that city in the old sailing ship Ivy in 1884, after making several voyages in sailing ships. He was born in Stockholm, Sweden, in 1865.

Upon arriving in Seattle Mr. Stromberg served for several years on a United States revenue cutter stationed at Port Townsend, then returned to the former city to serve with the Puget Sound Tug Boat Company, where he spent twenty years. In 1913 he went as chief engineer on the Roosevelt, a U. S. Bureau of Fisheries boat. Four years later he left for South America working out of various ports there for three years and returning to Seattle in 1920.

BETHLEHEM SHIP-REPAIR SERVICE



in New York Harbor

With the acquisition of United Shipyards, Inc., Bethlehem now offers complete ship-repair service in the Port of New York. These properties will be known as the New York Plant of Bethlehem Shipbuilding Corporation, Ltd., and the separate yards will be referred to as the Staten Island Works, Brooklyn 56th Street Works, Brooklyn 27th Street Works, and the Hoboken Works.

The New York Plant, in conjunction with Bethlehem's ship-repair yards at Boston, Baltimore, San Francisco, and San Pedro, places Bethlehem in an excellent position to handle any repair job on east or west coast. Facilities now include nine separate yards on the Atlantic Coast and four on the Pacific.

BETHLEHEM SHIPBUILDING CORPORATION, LTD.

General Offices: 25 Broadway, New York City; Quincy, Mass. *District Offices:* Boston, Baltimore, San Francisco, os Angeles. *Shipbuilding Plants:* Quincy, Mass.; New York, N. Y.; Sparrows Point, Md.; San Francisco, Calif. *Ship-Repair Yards:* Boston, Mass.; Baltimore, Md.; New York, N. Y.; San Francisco, Calif.; San Pedro, Calif.

BETHLEHEM STEEL

Building in American Yards

Pacific Coast

BETHLEHEM SHIPBUILDING CORPORATION, LTD.
(Union Plant)
San Francisco

NEW CONSTRUCTION: **Hull 5356—Maury (DD401);** launched February 14, 1938; completion date about August 1, 1938. 1500-ton destroyer for U. S. Navy: length, 341′ 3⅝″; beam, 35′ 6⅛″; depth, 19′ 8″.

DRYDOCK AND ROUTINE REPAIRS: **Vitus Bering, H. D. Collier, Jane Christenson, M.S. Richlube, Peter Lassen, Calmar, M.S. Contra Costa, Knud Rasmussen, Capac, Tug W. B. Storey, Vermar, Barge S. O. Co. No. 4, M.S. Roseville, Tug Sea Rover, U.S.C.G.P.B. Daphne, U.S.C.G.P.B. Nemaha, Admiral Halstead.**

FELLOWS & STEWART, INC.
Wilmington, Calif.

NEW CONSTRUCTION: **Contract No. 671, 37 foot auxiliary Marconi sloop.** Completion date about July 15, 1938.

Contract No. 672, 75 foot overall Class "N" sloop. Completion date about October 1, 1938.

GENERAL ENGINEERING & DRY DOCK CO.
Foot of Fifth Avenue
Oakland, Calif.

DRYDOCK AND ROUTINE REPAIRS: **Noyo, Gas. S. California, Tug Governor Irwin, Hamakua, Indianan, M.S. Korrigan III, Davenport.**

HARBOR BOAT BUILDING CO.
Berth 264, Fish Harbor
Terminal Island, Calif.

DRYDOCK AND ROUTINE REPAIRS: **Sea Tern, Salvage Tug Retriever.**

HONOLULU IRON WORKS
Honolulu, T. H.

DRYDOCK AND ROUTINE REPAIRS: **Ensley City, Makaweli, Constance Chandler, Marion Otis Chandler, Makua, Maunaloa, Manulani, Golden Cloud, Horda, Steel Mariner.**

LAKE WASHINGTON SHIPYARDS
Houghton, Wash.

DRYDOCK AND ROUTINE REPAIRS: **Yacht El Primero, M.S. Setac.**

LOS ANGELES SHIPBUILDING & DRY DOCK CORP.
Los Angeles Harbor
San Pedro, Calif.

DRYDOCK AND ROUTINE REPAIRS: **Yachts Haida and Enchantress, Western Oil Barge, S. O. Barge No. 7, G. P. Barge No. 3, Tug Lebec, Sunset Oil Barge, Cabrillo, Lawrence Phillips, Float Santa Monica, Golden Dragon, Dorothy Philips, M.V. Honomu, M.V. Toorak, Cadaretta, Anglo Indian.**

MARE ISLAND NAVY YARD
Mare Island, Calif.

NEW CONSTRUCTION:

Sturgeon, Submarine (SS187); keel laid October 27, 1936; launching date March 15, 1938; estimated delivery September, 1938.

Swordfish, Submarine (SS193); keel laid October 27, 1937; estimated delivery date August 1, 1939.

Order received for construction of two harbor tugs, YT 133 and YT 134, dated October 7, 1937.

Order received for construction of garbage lighter (YG21), dated February 8, 1938.

Order received for construction of one submarine tender, dated June 30, 1938.

Order received for construction of one submarine (203), dated June 30, 1938.

DRYDOCK AND ROUTINE REPAIRS: **Quincy, Portland, Houston, Reuben James, Goff, Clark, McDougal, Boggs, Lamberton, Relief, Bridge, Kalmia, Henderson, Whitney, Shark.**

THE MOORE DRY DOCK CO.
Oakland, Calif.

NEW CONSTRUCTION: **Hull No. 192, Komoku, bay and river freighter** for Bay and River Navigation Company. Length molded 182′ 11½″, breadth molded 40′ 0″, depth molded 10′ 0″; twin screw; powered by Union diesel engines of 275 H.P. each. Contract date February 15, 1938; keel laid May 4, 1938; launched June 15, 1938.

DRYDOCK AND ROUTINE REPAIRS: **Shoshone, Maliko, W. S. Rheem, Chas. L. Wheeler, Jr., Mexican, Tug Hercules, Elizabeth, U. S. Grant, Yuba, Portland, Georgian, Carolinian, Edw. Luckenbach, W. B. Walker, Vancouver, San Gabriel, Golden Horn, Montanan, American Rose, Sea Maid, Patterson, Five Brothers, Frances, Kailua, Ohioan, Dakotan, Virginian.**

THE PUGET SOUND NAVY YARD
Bremerton, Washington

NEW CONSTRUCTION:

U.S.S. Wilson (Destroyer No. 408); standard displacement, 1500 tons; keel laid March 22, 1937.

U.S.S. Charles F. Hughes (Destroyer No. 428); standard displacement 1600 tons; o der placed by Navy Department Decembe 7, 1937.

TODD SEATTLE DRY DOCKS, INC.
Harbor Island
Seattle, Wash.

DRYDOCK AND ROUTINE REPAIRS **Point Salinas, M.S. Kalakala, Harry Luckenbach, Paul Luckenbach, Barge MT No. 6 Denali, Point Ancha, Bering, M.S. Ballard, Charcas, M.S. Northland.**

WESTERN BOAT BUILDING CO., INC
2505 East 11th Street
Tacoma, Wash.

NEW CONSTRUCTION:

Hull No. 131, purse seine fishing boat 78′x20′x9′; 200 H.P. Atlas engine; launching date May 1, 1938.

Hull No. 132, 50′ pick-up fishing boa for New England Fish Company. Keel lai March 12, 1938.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE CO.
Pittsburgh, Pa.

NEW CONSTRUCTION: **Three carg barges** 132′ x 35′ x 10′ for Campbell Transportation Co., Pittsburgh, Pa. **Delivered.**

BATH IRON WORKS
Bath, Maine

NEW CONSTRUCTION: **Hulls Nos 161, 162 and 163; DD394 Sampson, DD39 Davis and DD396 Jouett; three 1850-to destroyers for U.S. Navy;** date of contrac September 19, 1935. Keels laid, No. 161 April 8, 1936; No. 162, July 28, 1936; No 163, March 26, 1936. Launching dates No. 161 April 16, 1938; No. 162 **July 30 1938;** No. 163 September 24, 1938; **estimated delivery dates August,** October an **December, 1938,** respectively.

Hulls Nos. 170-171, DD409, Sims, an **DD410, Hughes, two 1500-ton destroyers** f U. S. Navy; contract date October 12, 1936 keels laid July 15 and September 15, 1937 respectively; launching dates, indefinite; d livery dates April, 1939, and June, 19 respectively.

Hulls Nos. 177 and 178, DD423 an **DD424, two 1620-ton destroyers** for U Navy. Contract date September 30, 19 delivery dates April and June, 1940, r spectively.

East Coast -- West Coast Gulf and Great Lakes!

●

Operators in all maritime districts are daily learning the advantages of steaming with XZIT. There is a nation-wide sales and service organization . . . there's an XZIT man in your district, ready to demonstrate our product in your engine-rooms. You'll find XZIT economy records very interesting . . . particularly if they are records of your own ships!

●

# XZIT

Fire Scale and Soot ERADICATOR

● XZIT

This scientific combination of chemicals eliminates soot, cracks off existing scale and prevents new scale from forming. Used and endorsed by leading Engineers in both Marine and Industrial fields. We will gladly demonstrate XZIT to you. Phone or write for full information.

XZIT SALES COMPANY

Hoboken, N. J.
1031 Clinton Street

779 Bryant Street, San Francisco
SUtter 7338

These XZIT Offices for Your Convenience:

BALTIMORE, MARYLAND:
Chamber of Commerce Building
(Calvert 5829)

BOSTON, MASSACHUSETTS:
11 Farnsworth Street
(Hubbard 9032)

DETROIT, MICHIGAN:
1627 W. Fort St.
(Randolph 3540)

ATLANTA, GEORGIA:
200 Peachtreet Street

HOUSTON, TEXAS:
423 Broadway
(Wayside 3966)

CHICAGO, ILL.:
407 South Dearborn St.
(Harrison 4977)

CLEVELAND, OHIO:
9101 Detroit Avenue
(Woodbine 1730)

MOBILE, ALA.:
57 North Water Street
(Dexter 3779)

SAVANNAH, GA.:
11 West Bay Street
(Tel. 8811)

PHILADELPHIA, PENNSYLVANIA:
1215 Commercial Trust Bldg.
(Rittenhouse 2496)

HONOLULU, T. H.:
919 Bethel St.

PORTLAND, ORE.:
45 S. W. First Avenue

SEATTLE, WASHINGTON:
1241 Railroad Ave. South

LOS ANGELES, CALIF.:
178 E. 58th Street
(Century 25227)

NEW ORLEANS, LOUISIANA:
916 South Peters Street
(Raymond 3203)

BETHLEHEM SHIPBUILDING CORPORATION, LTD.

Fore River Plant,

Quincy, Mass.

NEW CONSTRUCTION:

CV7, Wasp, Airplane Carrier for U. S. Government: keel laid April 1, 1936: estimated launching date December, 1938.

Hulls Nos. 1467, 1468, 1469, three passenger and freight steamers for Panama Railroad S.S. Co.: 486 feet x 64 feet x 38 feet 6 inches; 16½ knot speed. Keels laid, Nos. 1467 and 1468, October 25, 1937; No. 1469, November 15, 1937; estimated launching dates September 24, 1938, November, 1938, and January, 1939.

Hulls Nos. 1470 and 1471, two 1500-ton destroyers for U. S. Government; delivery dates March, 1940, and May, 1940.

Hulls Nos. 1472 and 1473, two diesel powered trawlers 147'0" overall, 128'9" perps., 27'0" beam, 14'4" depth; estimated delivery dates November 15 and December 15, 1938.

BETHLEHEM SHIPBUILDING CORPORATION, LTD.

Sparrows Point Plant

Sparrows Point, Md.

NEW CONSTRUCTION:

Four 13,000 deadweight ton steam turbine driven tankers for Standard Oil Co. of N. J.; length 442', beam 64', depth 34' 10", gross tonnage 7,600, speed 12 knots. Esso Baton Rouge launched November 13, 1937; R. W. Gallagher launched January 22, 1938; Esso Baltimore launched June 4, 1938; **Esso Charleston launched July 23, 1938.**

One tanker for Texas Co.; about 13,000 deadweight tons; steam turbine.

Hull No. 4334; one 13,000 dwt. oil tanker for Union Oil Co. of Calif. Contract signed March, 1938.

Hulls Nos. 4329, 4330, 4331; three 16,300 dwt. ton tankers for Standard Oil Co. of N. J.; 18 knots speed. Contract signed January 3, 1938.

Hulls Nos. 4332 and 4333; two 16,000 dwt. tankers for Socony Vacuum Oil Co. Contract signed February, 1938.

BETHLEHEM SHIPBUILDING CORPORATION, LTD.

Staten Island Plant

Staten Island, N. Y.

NEW CONSTRUCTION:

Hull No. 856, fireboat for City of New York. Length O.A. 134'0", breadth 32'0", depth 13'3". Keel laid April 19, 1938; **estimated launching date July 28, 1938;** estimated delivery date September 8, 1938.

BOSTON NAVY YARD

Boston, Mass.

NEW CONSTRUCTION:

DD402, Mayrant, and DD403, Trippe, two light destroyers for United States Navy; LBP 334', beam 35'6", depth 19'8"; keels laid April 15, 1937; launched May 14, 1938; estimated delivery dates October, 1939, and November, 1939, respectively.

DD415, O'Brien, and DD416, Walke, two destroyers; LBP 341', beam 36', depth 19'8"; keels laid May 31, 1938; delivery date 1940.

DD425, Madison, and DD426, Lansdale, two destroyers; 341'0" x 36'0" x 19'8". Keel laying date December 1, 1938, launching date November 1, 1939; delivery date 1940.

One harbor tug for U. S. Navy; 98'0" LBP x 24'0" x 13'6"; keel laid March 28, 1938; launched June 10, 1938; completion date September 15, 1938.

BROOKLYN NAVY YARD

Brooklyn, N. Y.

NEW CONSTRUCTION:

CL 48, **Honolulu, light cruiser;** L.B.P. 600', beam 61'8", standard displacement 10,000; geared turbine engines; express type boilers; keel laid September 10, 1935; launched August 26, 1937; **estimated delivery, August 1, 1938.**

CL 50, **Helena, light cruiser;** L.B.P. 600', beam 61'7¾", standard displacement 10,000; geared turbine engines; express type boilers; keel laid December 9, 1936; **estimated launching date August 27, 1938;** estimated delivery January 2, 1940.

BB 55, **North Carolina, battleship;** L.BP 714' 0", beam to outside armor 108' 0", std. displ. 35,000 tons; geared turbine engines; express type boilers. Keel laid October 27, 1937; estimated launching date May 1, 1940; contract delivery September 1, 1941.

CHARLESTON, S. C., NAVY YARD

Charleston, S. C.

NEW CONSTRUCTION:

Order placed for **one harbor tug;** LOA 124' 9", length between perpendiculars 117', breadth molded 28', depth molded 16'; keel laid August 2, 1937; launched March 7, 1938.

Order placed for **one harbor tug;** LOA 110' 3", LBP 98' 0", breadth 24' 0", depth at side amidships 13' 6". No dates set.

Order placed for one **harbor tug;** 65 feet long.

DEFOE BOAT & MOTOR WORKS

Bay City, Mich.

NEW CONSTRUCTION:

Two diesel electric towboats 94' x 25'; steel construction; powered by 1000 S.H.P. General Motors engines. For General Motor Sales Corp. **Delivery date July, 1938.**

Hulls Nos. 72 and 73; two diesel electric harbor cutters for Coast Guard; 110' x 26' 6"; powered by 1000 S.H P. General Motors engines; steel construction. Delivery date April, 1939.

THE DRAVO CORPORATION

Engineering Works Division

Pittsburgh, Pa., and Wilmington, Del.

NEW CONSTRUCTION:

Hull No. 1452; one welded steel oil barge 195' x 35' x 9'6", for stock; 489 gross tons.

Hulls Nos. 1459-1461; three welded cargo barges 280' x 47' x 11', for Inland Waterways Corporation; 4332 gross tons.

Hulls Nos. 1462-1465; four welded cargo box barges 100' x 26' x 6'6", for stock; 660 gross tons.

Hulls Nos. 1466-1475; ten welded W-5 coal barges 175' x 26" x 10'8", for stock; 4720 gross tons.

Hull No. 1476; one welded steel coal barge 126' x 34' x 17' for M. & J. Tracy, Inc.; 673 gross tons.

This makes a total of 19 hulls with a total gross tonnage of 10,874 tons.

ELECTRIC BOAT CORP.

Groton, Conn.

NEW CONSTRUCTION:

Hull No. 28, Skipjack, SS184, standard displacement, 1450 tons; keel laid July 22, 1936; launching date October 23, 1937; **delivered July, 1938.**

Hull No. 29, Sargo (SS188); standard displacement 1450 tons, keel laid May 12, 1937; launching date June 6, 1938; delivery date February, 1939.

Hull No. 30, Saury (SS189); standard displacement 1450 tons; keel laid June 28, 1937; **launching date August 29, 1938;** delivery date April, 1939.

Hull No. 31, Spearfish (SS190); standard displacement 1450 tons; keel laying date September 9, 1937, launching date October 29, 1938; delivery date June, 1939.

Hull No. 33, Seadragon (SS194); 1450 tons; keel laying date April 18, 1938; delivery date December, 1939.

Hull No. 34, Sealion (SS195); 1450 tons; keel laying date June 15, 1938; delivery date February, 1940.

THE FEDERAL SHIPBUILDING AND DRYDOCK COMPANY

Kearny, N. J.

NEW CONSTRUCTION:

Three destroyers, DD397 Benham, DD398 Ellet and DD399 Lang, 1500 dis. tons; keels laid September 1, 1936, December 3, 1936, and April 5, 1937, respectively; **launching dates** April 16, June 11 and **August, 1938,** respectively.

Two destroyers, DD411 Anderson and DD412 Hammann; keels laid November 15, 1937, and January 17, 1938, respectively.

Hulls Nos. 149, Pan-New York, and 150, two 12,900-ton tankers for Pan American Petroleum and Transport Co.; 440' B.P. x 66'6" x 34'6", 450' O.A.; Isherwood Arcform design of hull form and longitudinal hull framing. Keels laid November 15, 1937, and January 10, 1938, respectively; **launching dates** May 14 and **July 22, 1938;** estimated completion date October, 1938.

Hulls Nos. 151, 152 and 153, three tankers for Standard Oil Co. of New Jersey.

Hulls Nos. 154, 155, 156 and 157, four C-2 cargo vessels for U. S. Maritime Commission.

INGALLS IRON WORKS CO.

Birmingham, Ala.

NEW CONSTRUCTION:

One 15-ton derrick boat hull for U.S. E.D.; launched June 1, 1938.

Two diesel dredge tenders 63' x 15'6" x 6'3" for U. S. Engineer Office, Memphis, Tenn. Launching date about September 10, 1938.

Ten hopper type cargo barges 280' x 48' x 11' for Inland Waterways Corp. **Launching dates June to October, 1938.**

JAKOBSON & PETERSON, INC.

Brooklyn, N. Y.

NEW CONSTRUCTION:

Hull No. 274, 84-foot all welded steel tug. Launched June 14, 1938; delivered July 31, 1938.

Hull No. 275, 70-foot auxiliary yawl. Launched June 9, 1938; delivered June 25, 1938.

Hull No. 276, 86-foot all welded steel tug. Launching date August 15, 1938; delivery date October 1, 1938.

that Douglas Corrigan has glorified the "Model T airplane" we this photo of A. O. Pegg, marine superintendent of Union Oil of California, taken some several years ago when the jaloppy in the d was a current model. The view is also interesting to those who hat San Pedro looked like in those days.

s now back at the Bethlehem yard supervising the building of ew tankship.

cCormick Vessel akes Notable ver Trip

lailed as marking a new era in Columbia River nsportation, the McCormick Steamship Company's ARLES L. WHEELER, JR., arrived at the Port The Dalles, Oregon, during the month of June er a noteworthy voyage past Bonneville, through Cascade Rapids and on to her destination to log 0-mile river journey.

aptain **Peter Lund** was in command and reported t all ran smoothly. At the engine controls was **ief F. L. Streets,** who tells us the Wheeler's power nt functioned perfectly despite a ten-mile current ve the locks.

he up-voyage was accomplished in seven and one f hours. The down-grade was considerably quicker. 0 tons of cargo was unloaded at The Dalles amidst ala celebration.

Safety at Sea
with **LUX**

Many Ferry Companies have adopted LUX as the most suitable fire protection for their Ferries.

A few of the LUX protected ferries are listed below:

- SACRAMENTO NORTHERN RAILWAY CO.
  - Ramon
- MARTINEZ-BENICIA FERRY CO.
  - Issaquah
  - City of Seattle
- RICHMOND-SAN RAFAEL FERRY CO.
  - Sonoma Valley
  - City of San Rafael
  - City of Richmond
  - Charles Van Damme
- KEY SYSTEM
  - San Leandro
  - Hayward
  - Yerba Buena
  - Treasure Island
- SOUTHERN PACIFIC RY. CO.
  - Sacramento
  - Santa Clara
  - Alameda
  - Oakland
  - Piedmont
  - Berkeley
  - Sierra Nevada
- NORTHWESTERN PACIFIC RAILWAY CO.
  - Tamalpais
  - Cazadero
  - Eureka
- PUGET SOUND NAVIGATION CO.
  - Iroquois
  - Olympic

LUX carbon dioxide protection for oil fired boiler rooms and diesel engine rooms has been internationally adopted. Steamers like the "Queen Mary" and "Nieuw Amsterdam" and Motorships like the "Pilsudski" and "Santa Barbara" are LUX protected.

For full particulars on LUX carbon dioxide fire extinguishing equipment write to

Walter Kidde & Company, Inc.
Los Angeles **Seattle**
San Francisco **New York**

LEVINGSTON SHIPBUILDING CO.

Orange, Texas

NEW CONSTRUCTION:

One all welded petroleum barge 92′ x 27′ x 6′, for stock. **Delivered July, 1938.**

MANITOWOC SHIP BUILDING CO.

Manitowoc, Wis.

NEW CONSTRUCTION:

One tanker for Socony-Vacuum Oil Company, Inc., New York: 290′ x 49′6″ x 20′6″; 23,600 barrels capacity; 1500 H.P. twin screw diesel. Launched June 9, 1938; **delivery date August, 1938.**

THE MARYLAND DRYDOCK CO.

A Subsidiary of Koppers Company,
Baltimore, Maryland

DRYDOCK AND ROUTINE REPAIRS:

U. S. Engineers Department Dredge Culebra, Lightship No. 94.

THE NEW YORK SHIPBUILDING CORPORATION

Camden, N. J.

NEW CONSTRUCTION:

Hull No. 416, Phoenix (CL46), light cruiser; 10,000 tons; for U. S. Navy Department; keel laid 1937; launched March 12, 1938.

One destroyer tender for U. S. Navy; order placed December 27, 1937.

One seaplane tender for U. S. Navy; order placed December 27, 1937.

NEWPORT NEWS SHIPBUILDING & DRYDOCK CO.

90 Broad Street, New York

NEW CONSTRUCTION:

H361, light cruiser, CL47, Boise, keel laid April 1, 1935; launched December 3, 1936; **delivery date July, 1938.**

H362, light cruiser, CL49, St. Louis, keel laid December 10, 1936; launched April 15, 1938; delivery date April, 1939.

Hulls Nos. 363-364, two destroyers, Nos. 413, Mustin, and 414, Russell; keels laid December, 1937; delivery dates June and August, 1939.

Hull No. 369, twin screw mail, passenger and cargo liner for United States Lines Co., length 723′, beam 92′, depth 45′.

Hulls Nos. 370, 371 and 372, three oil tankers for Standard Oil Company of New Jersey; gross tonnage about 11,500 tons; L.B.P. 525′, breadth molded 75′, depth molded 39′.

Hulls Nos. 373, 374, 375 and 376, four single screw cargo vessels for United States Maritime Commission; turbine propulsion; gross tonnage about 9000 tons; length 435′, breadth 63′, depth 40′6″.

PHILADELPHIA NAVY YARD

Philadelphia, Pa.

NEW CONSTRUCTION:

Order placed for **DD404, 1500-ton destroyer;** no dates set

PORTSMOUTH, N. H., NAVY YARD

Portsmouth, N. H.

NEW CONSTRUCTION:

Four submarines, Sculpin, Squalus, Searaven and Seawolf.

THE PUSEY & JONES CORP.

Wilmington, Del.

NEW CONSTRUCTION:

Hulls Nos. 1068, Quaker, and 1069, Cavalier, two single screw, steel freight steamers for the Philadelphia and Norfolk Steamship Co., Philadelphia, Pa. L.O.A. 292′, L.B.P. 280′, beam 48′6″, depth 32′3″, draft 18′; geared turbine drive 4000 S.H.P.; 2 water tube boilers. No. 1068 launched February 15, 1938; **delivered June 23, 1938.** No. 1069 launched April 14, 1938; **estimated delivery date July, 1938.**

Hull No. 1070, one steel hopper dredge, Chester Harding; 2,500 cubic yard capacity; length overall 308′2″, length B.P. 300′0″, breadth molded 56′0″, depth molded 29′0″. Contract date February 14, 1938; keel laid May 15, 1938; delivery May, 1939.

SUN SHIPBUILDING AND DRY DOCK COMPANY

Chester, Pa.

NEW CONSTRUCTION:

Hull No. 168, One diesel tanker for stock account; equipped with Sun-Doxford engine; 542′5″ x 70′ x 40′; 18,360 D.W.T. Keel laid August 19, 1937; launched May 20, 1938; **delivered July 8, 1938.**

Hull No. 169, one oil tanker (steam); 520′ x 70′ x 40′; for Atlantic Refining Co.; 18,500 tons; keel laying date November 30, 1937; **launching date July 9, 1938; delivery date August 6, 1938.**

Hulls No. 172, 173 and 174, three tankers for Standard Oil Co. of New Jersey; steam turbine; 525′ x 75′ x 39′; 16,300 dwt. **Keel laying dates** April 18, May 31 and **August 1, 1938;** delivery dates February 1, April 11 and May 15, 1939.

American merchant ship construction listed in the foregoing aggregates 44 seagoing vessels with a total gross tonnage of 393,983. This is the largest total of American ships under construction since the close of the war-time program.

Deck Officers' Licenses

The following list shows licenses granted during the month of June to deck officers of the merchant marine at Pacific Coast offices of the Bureau of Marine Inspection and Navigation:

Name and Grade	Class	Condition
SAN FRANCISCO		
Carl F. Nordin, Master	OSS, any GT	RG
Thomas N. Lewis, Master	OSS, any GT	RG
Charles F. Humphrey, Master	OSS, any GT	RG
Carl C. Potter, Master	OSS, any GT	RG
Herbert C. Fridley, Chief Mate	OSS, any GT	RG
John W. Home, 2nd Mate	OSS, any GT	RG
Paul H. McBride, 2nd Mate	OSS, any GT	RG
John M. Van Orden, 2nd Mate	OSS, any GT	RG
Albert G. Fenley, 3rd Mate	OSS, any GT	O
John E. Haukom, 3rd Mate	OSS, any GT	O
Allison M. Reid, 3rd Mate	OSS, any GT	O
HONOLULU		
Randall R. Hyer, 2nd Mate	OSS-OMS, any GT.	RG
SAN PEDRO		
Bernard C. Dennis, Chief Mate	OSS, any GT	RG
Matthew J. Lindeman, 2nd Mate	OSS, any GT	O
Seward B. Calhoun, 3rd Mate	OSS, any GT	O
Robert J. McKenzie, 3rd Mate	OSS, any GT	O
William P. Connolly, 3rd Mate	OSS, any GT	O
Charles W. McGowan, Jr., 2nd Mate	OSS, any GT	O
SEATTLE		
Charles L. Kiewert, Master & Pilot	OSS, any GT	RG

Abbreviations: GT is gross tonnage; RG is raised grade; O is original license; OSS is ocean steamer; OMS is ocean motorship.

PACIFIC MARINE REVIEW

SEPTEMBER

1938

LOS ANGELES - LONG BEACH HARBOR
An eight mile wide view of the breakwater and ships of U. S. Navy.
IN FOREGROUND, LEFT TO RIGHT: Cities of San Pedro, Wilmington and Long Beach. Los Angeles in distance.

Photo by Spence

"A FINE CAR" . . . *you'd quickly agree*

The richness of appointments . . . the quality of the finish . . . the soft purr of a perfectly tuned motor . . . these all quickly indicate even to the untrained eye that it's a quality automobile.

But not so easily can the relative quality of several pieces of rope quite similar in appearance be told. It would require a trained expert in this field to know the amount of strength and wear that might be expected of each.

Because of this fact, Marine rope users take no chances. They specify rope that they know from reputation and *proven performance* will give them the maximum of safety and satisfaction.

This is why, aboard most of the ships that ply the Pacific, you will find the standard to be TUBBS two famous Marine rope brands—

TUBBS ROPE

SUPERCORE - - EXTRA SUPERIOR MANIL

TUBBS *Cordage Company*

200 Bush Street, San Francisco
Mills in San Francisco

PACIFIC MARINE REVIEW

S PTEMBER 1938

Official Organ

Pacific American
Steamship Association

Shipowners Association
of the Pacific Coast

Our Frontispiece

Our frontispiece this month is from a photograph of the six-masted iron barkentine E. R. Sterling. This vessel was built at the Harland & Wolff yard, Belfast, in 1883 and has had a hectic career under many aliases, including Everett G. Griggs, Columbia, and Lord Wolseley. Her last clearance as a barkentine was from Adelaide, Australia, in September, 1927. Totally dismasted and in distress, she was towed into Horta and later into Falmouth by a British steamer. Whether her hull was broken up or used as a storage hulk does not appear on available records.

CONTENTS

The Replacement Program for Our Merchant Marine 19
By E. C. Mausshardt.
Dollar Lines to U. S. Maritime Commission 21
Los Angeles Harbor Building for Future 22
Shipbuilding in Southern California 24
By Owen E. Durkin.
Your Problems Answered 28
By "The Chief."

Licenses Granted:

Engineers' Licenses 30
Deck Officers' Licenses 58
Marine Geared Turbine Efficiencies 31
By Hans G. Bauer.
Steady As You Go 32
For the Deck Officers.
M. S. Komoku 34
A Sugar Boat De Luxe.
A Modern Gasoline Tanker for Great Lakes Service 38
Diesel Power Unit Replaces 5 Gasoline Engines at Point Arena Lighthouse 41
The Butterfly Map 42
By B. J. S. Cahill.
Spunyarns and Catharpins 44

On the Ways:

Latest News from American Shipyards 45
Building in American Yards 48
Safety at Sea and Marine Insurance Notes 50

Miscellaneous:

Los Angeles Marine Exchange, 27; Windjammers for Training, 33; Trade Literature, 47; Changes of Masters, 52; New Agency, 58.

BLISHED AT 500 SANSOME STREET . . . . SAN FRANCISCO

ered as second class matter June 20, 1913, at the post office, San Francisco, under the Act of March 3, 1879. Published on the 1st of each nth. Advertising and editorial forms close on the 15th. Subscription price, one year: Domestic, $1.50; foreign, $2.50; two years: Domestic, 50; foreign, $4.00; three years: Domestic, $3.00; foreign, $5.50; single copies, 25c. Chas. F. A. Mann, Northwest Representative, 1110 et Sound Bank Bldg., Tacoma, Washington. New York Office, Suite 404-405-406, Two Hundred Broadway, Telephone COrdlandt 7-3579.

New York City copies of Pacific Marine Review can be purchased at the news stands of I. Goldberg, 42 Broadway; Harry Nash, 17 Battery ce. Philip Mandara, Greenwich Street and Battery Place. In Washington, D. C., at the news stand of the Carlton Hotel, 16th and K Streets.

J. S. Hines	**B. N. DeRochie**	**Alexander J. Dickie**	**Paul Faulkner**	**F. Dryden Moore**
sident and Publisher	Assistant Publisher	Editor	Advertising Manager	Assistant Editor

PACIFIC MARINE REVIEW

VOLUME XXXV SEPTEMBER 1938 NUMBER 9

The Replacement Program For Our Merchant Marine

By E. C. MAUSSHARDT
Manager, Pacific Coast District, U. S. Maritime Commission

For more than a century shipping has played a most important part in the social and economical development of the Pacific Coast. Since the early days of the gold rush up to the present day ships have arrived and departed, taking our products to all corners of the world and bringing back other products of food, raw materials and manufactured goods from many different lands. Ships of every foreign maritime nation as well as our own have made this their port of call.

The twin functions of shipping, which are service to commerce and defense, are in themselves contradictory, both with respect to each other and with respect to the agencies which they serve. Successful commercial operation calls for economy and reliability; military considerations may dictate uneconomic speeds, extra bulkheads and other features which tend to reduce earning capacity. It also is a source of international troubles.

In undertaking the rehabilitation of the American merchant marine, the United States Maritime Commission was confronted with these apparently baffling and contradictory factors of the shipping problem, which it promptly proceeded to analyze as a practical and realistic approach to its task.

This task in the final analysis resolves itself into finding a reasonable and workable answer to these three simple questions:

1. What do we need?
2. How can we get it?
3. What will it cost?

The Commission found with respect to the first question that the foreign trade of the United States falls roughly into some 20 major trade areas. It concluded that the fullest development of our foreign commerce makes it necessary tor the United States to be represented in each of these areas.

● Naval Necessities

The Commission found also that commercial shipping is a vital part of our facilities for defense. The United States maintains one of the largest navies in the world. It would not be the part of wisdom for us to maintain such an establishment without an adequate complement of auxiliary vessels.

The American merchant marine is, of course, made up of various types of vessels engaged in different types of trade. Vessels engaged in domestic services are protected against foreign competition and should, presumably, be able to survive without Government assistance.

Vessels in foreign trade may be divided roughly into two groups—those able to operate without assistance and those which require Government aid. Vessels in the first category are principally industrial carriers, or at least vessels with strong industrial connections. Vessels in the second group are the immediate concern of the Maritime Commission.

● Replacement Program

The replacement requirements of American ship lines, in both domestic and foreign trade, are enormous. Our total seagoing fleet comprises some 1,422 vessels of 2,000 tons and over, aggregating 8,407,000 tons. Of this fleet a total of 1,305 vessels of 7,402,000 tons will be 20 years old or more by 1942. To replace all ships now approaching obsolescence would require the construction of an average of 261 vessels of about 1,500,000 tons per year. This staggering program would cost in the neighborhood of $2,500,000,000.

The subsidized fleet, with which the Commission is directly concerned, consists of 168 vessels. Of this fleet 131 vessels, of 788,000 tons, will become 20 years old within the next five years. These vessels, as has been pointed out, were built during the war period on the basis of pre-war designs so that most of them are already obsolescent. Their excessive operating and repair cost are a drain alike upon the companies and upon the Federal treasury. They must be replaced within the next few years.

● Subsidized Replacement

One of the chief difficulties of the American merchant marine has been our lack of a stable policy. That lack forced us, during the World War, into the mightiest shipbuilding program in history. That program, in turn, has now brought us face to face with the problem of replacing the majority of our vessels, both foreign-going and domestic, within the short space of a few years. The American merchant marine, unfortunately, was built as a unit, and thus, unfortunately, is about to obsolesce in the same way.

To meet the imperative need for new ships, the Commission has required steamship companies which have been granted permanent operating subsidies to make definite plans for replacements as a condition of the contracts, and automatic cancellation is provided in the event that new construction is not undertaken according to schedule.

Conforming to this policy, commitments have been made by eight subsidized shipping companies to build from 30 to 53 ships for the foreign trade between now and 1942, and there is a possibility that other lines which are now negotiating for permanent subsidies may build 12 more in that time.

The Commission itself has initiated a construction program which includes 12 cargo ships; 12 high-speed tankers for use as naval auxiliaries, which will be built by the Standard Oil Company of New Jersey in cooperation with the Commission; and the model safety liner which will replace the Leviathan in the North Atlantic service.

● Cost of Program

The final question, What will it cost? The Commission made an earnest endeavor to determine the probable cost of the merchant marine program for the next few years. It is forced to conclude that the American people must be prepared to pay larger subsidies than those now provided if they are to maintain an efficient fleet in international trade.

Regardless of whether or not the operating differentials can be justified mathematically, careful consideration by the Commission of every factor involved indicates that the operating subsidies required to keep these lines in existence will probably average between $15,000,000 and $20,000,000 a year.

In addition, substantial payments will be required to subsidize construction. Here again it is difficult to arrive at better than a rough approximation of the actual cost, since the subsidies will depend upon the number of ships constructed and will vary with the fluctuation of American and foreign costs. If the lines should be able to build 65 vessels within the next five years, as indicated, this would involve an outlay of approximately $137,000,000. The Government's contribution would probably exceed $50,000,000 for the five-year period, or an annual charge of some $10,000,000.

It is evident, therefore, that the subsidies, both construction and operating, will aggregate from $25,000,000 to $30,000,000 a year. If the lines are unable to make needed replacements and the Government is forced into an extensive building program, the amount will, of course, be substantially increased.

The Commission now has $85,000,000 in its building fund. In addition Congress has authorized the expenditure of $115,000,000 for new construction. This makes a total of $200,000,000 now available for the purpose of rehabilitating American shipping in foreign trade.

● Public Support

Every American must view commercial independence and national defense as primary ends of his government—of any government. The public, most of all, must appreciate that an adequate merchant marine is the only way in which we can avoid risks to our commerce, when home needs call back foreign ships from their normal routes. The fear of extortionate rates or other discriminations cannot worry the American shipper when we possess our own merchant shipping.

In turn, as we attain the kind of merchant marine we want, the public as shipper and passenger is bound in plain intelligence to support it. This is true whether we rely upon the obligations of patriotism or the dictates of common sense. It is the height of nonsense for us, as a people, to subsidize our vessels through taxation while, as a people, we patronize exclusively the ships of our competitors.

The United States Maritime Commission has made a start on its program to rebuild the merchant marine, not in a riot of enthusiasm, not with an expenditure of billions, but with a careful approach that gives due regard to the factors of need, method and cost. Therein, we believe, lies our hope for the future of the American merchant marine.

The four cargo liners ordered by the Export Lines and the Maritime Commission from the Bethlehem Shipbuilding Corporation Ltd. are the first cargo ships to be built by a privately owned line under the subsidy provisions of the Merchant Marine Act of 1936. This illustration is an artist's conception of one of these vessels.

DOLLAR LINES TO U. S. MARITIME COMMISSION

The United States Maritime Commission announced August 19 that it had entered into an agreement with the Dollar Steamship Lines Inc., Ltd., under which it plans to acquire approximately 90 per cent of the company's voting stock.

Upon successful completion of the plan operations generally would remain in company hands.

The agreement covering the adjustment anticipates continuance of uninterrupted service and employment of both offshore and onshore personnel will continue and expand. It was signed in San Francisco by Reginald S. Laughlin, acting as special counsel for the commission, and a group of 13 corporations and individuals representing Dollar interests.

Terms of the agreement are contingent upon subsequent granting of a five-year operating differential subsidy which, as being worked out by commission experts, may be expected to run to approximately $[illegible]00,000 per year; granting of a loan of not less than $1,500,000 from commission funds for repairing and rehabilitating the company's fleet of 1[illegible] vessels, only four of which are now in operation; granting of a loan of approximately $2,500,000 to the company by the Reconstruction Finance Corporation to provide working capital which at present is practically exhausted.

Responsibility for meeting R.F.C. loan requirements rests solely upon the company, and the commission, under the plan, would continue to hold about $7,000,000 of mortgages on the company's ships in addition to mortgages to be acquired under the repair loan plan.

Assuming that the above terms are met with, the agreement signed at San Francisco August 19 will provide:

1. Transfer to the commission of absolute title to all Class B stock ([illegible]00,000 shares); title to 63,893 shares of Class A stock. In addition, the commission would acquire voting rights and other interests, subject to existing pledges, in another block of 51,533 shares of Class A stock of which 252,000 shares are outstanding.

This arrangement leaves 136,574 shares of Class A outside commission control as well as 34,243 shares of preferred.

2. Termination of the management agreement under which Robert Dollar Company has acted as managing agent of Dollar Steamship Lines Inc., Ltd., in this and other countries. Dollar Steamship Lines would acquire all leases, furniture, fixtures, equipment and automobiles used by Robert Dollar Company throughout the world in its capacity as managing agent. Dollar Steamship would also take over such personnel of the Robert Dollar Company as has been engaged in the managing agent activities. This proposal results in consolidation of operating and management activities with consequent anticipated increase in efficiency and substantial reduction in costs.

3. Termination within six months after the date of the agreement of the rights of Dollar of Delaware to the use of the name "Dollar," and all use of the Dollar flag and insignia.

4. Release of R. Stanley Dollar and certain of the so-called Dollar companies from liability under various guarantees they previously have given upon notes secured by ship mortgages upon the Dollar fleet. This action is taken in consideration of transfer of their voting stock to the commission.

5. Readjustments and extensions are contemplated in the maturity of various obligations owed the commission, the Anglo California National Bank, which is a creditor to the extent of approximately $2,050,000, and certain Dollar companies.

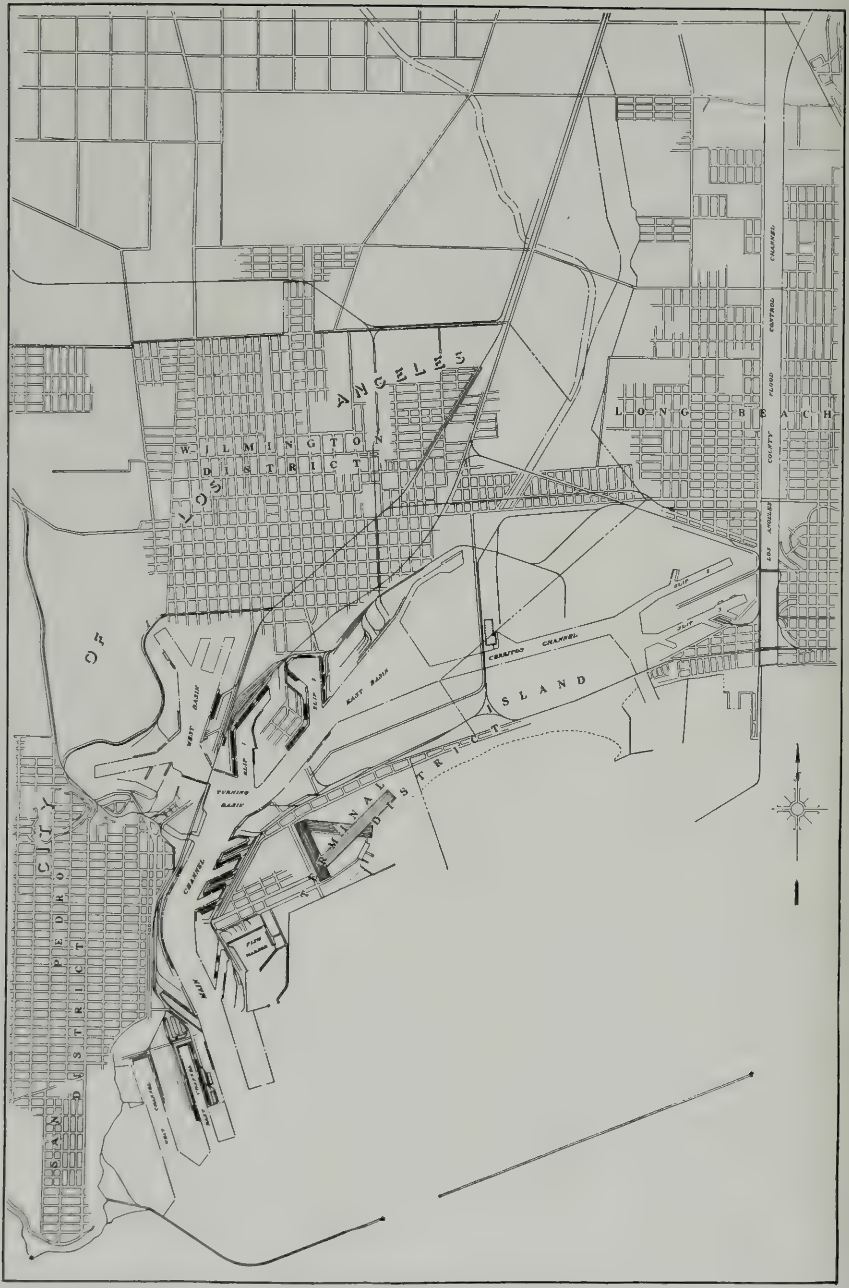
Commenting upon this adjustment plan and agreement, Chairman Emory S. Land said:

"The Dollar situation has been a matter of considerable anxiety to the commission for many months. The commission insists upon maintenance and efficient servicing of the vital trade routes covered by the Dollar Lines. They are of outstanding importance to our foreign trade and to our national defense. The commission, therefore, has explored conscientiously possibilities of a solution and has agreed to the adjustment plan signed today with the idea of preventing interruption of service and employment, such as would occur were the line to go into bankruptcy and follow the usual course of such procedure.

"The commission, it should be emphasized, has assumed no obligation to grant any loans or subsidies until satisfactory applications, meeting all requirements of the law, have been made by the company. Neither has it assumed any duty or obligation, direct or indirect, to pay any of the company's indebtedness, discharge any of its obligations, or even to hold any of the stock it has agreed to acquire upon satisfactory compliance by the company with the terms of the plan.

"The commission sincerely hopes that the proceedings required to carry through the agreement signed today will be promptly and satisfactorily completed. Under such circumstances it is anticipated that it may be possible to develop these lines into a sound unit of the American Merchant Marine."

Under the adjustment plan, the commission expects to have the 12 ships of the fleet put in condition and back onto trade routes that touch ports in California, Japan, China, the Philippines, via Hawaii, and also in around-the-world service, ports in the Straits Settlements, Ceylon, India, Suez Canal, Egypt, Gibraltar, Italy, France in the Mediterranean, New York, Havana, Dutch East Indies and the Panama Canal.



Map of the Los Angeles-Long Beach Harbor and adjacent port areas.

Los Angeles Harbor

Building for Future

Elevated to the post of president of the Los Angeles Board of Harbor Commissioners after five years' service on the board, the last two as vice president, Glen E. Arbogast, pioneer electrical contractor, entered on his new duties in July with a wide knowledge of the port and its problems.

oincident with the formal winding of the affairs of the Greater Harbor Committee of two hundred, organized by the Chamber in 1923, David Livingstone, editor of the Commercial News, and active in harbor and shipping matters generally, joined the staff of the Chamber August 15 to conduct intensive studies and plans for the future development of the Los Angeles-Long Beach Harbor. He will, of course, be a part of the Chamber's Harbor, Foreign Commerce and Shipping Department.

his arrangement follows the return to the Chamber of the committee's final records and the turning back to the Chamber of the committee's remaining funds. It is this money, of course, that is making possible Mr. Livingstone's task of studying the relation of the harbor to developments taking place around the world, both commercially and politically. It is by no means intended to duplicate the work of the Harbor Department in any way, but to cooperate with that department.

he Greater Harbor Committee grew out of a suggestion made in 1922 by the late Fred L. Baker, at that time president of the Los Angeles Steamship Company and the Los Angeles Shipbuilding & Drydock Company. It was brought together under the direction of the late Frank Wiggins, secretary and manager of the Chamber of Commerce, and Clarence H. Matson, who has been in charge of the Chamber's harbor, shipping and foreign trade work for many years. Two hundred public-spirited citizens, including a number in Long Beach, signed pledges to give a thousand dollars each to carry on extensive and intensive plans for a long-range development of the harbor. The committee did not collect all of the funds subscribed. The last $30,000 was not called for and, as previously noted, the committee is turning back several thousand dollars at this time to the Chamber.

The guiding spirit of the Greater Harbor Committee in its work was the late Henry M. Robinson, who was chairman of the committee, and who, by authority of the Chamber of Commerce, created an executive committee of seventeen. Former Congressman John D. Fredericks and Maynard McFie were vice-chairmen of the committee, and Henry S. McKee was treasurer. These, in addition to Mr. Page, made up the officers of the Greater Harbor Committee itself. Burt A. Heinly was executive secretary of the committee during its existence, and the firm of Leeds & Barnard was its engineer, except in the latter part of its existence, when Franklyn B. Cole acted as chief engineer.

The committee concluded its active work several years ago, but did not issue a formal statement of its accomplishments, as it was the contention of its leading members that the committee should claim no credit for work done. However, the great breakwater extension, completed last winter, the unification of the railroad terminals serving the harbor, the classification yard, the Anaheim Boulevard viaduct and plans for improvements around the West Basin were among the accomplishments brought about by the Greater Harbor Committee.

Mr. Robinson, whose work included many different activities, including membership on the U. S. Shipping Board, one of the three members of the Dawes Commission on German Reparations, a trustee of the Huntington Library, and a multitude of financial and commercial positions of magnitude, considered his work on the Greater Harbor Committee as one of his main achievements.

Shipbuilding in Southern California

Some reasons for allotting a share of the present shipbuilding program to the yards of Los Angeles Harbor

By OWEN E. DURKIN

Manager Marine Exchange, Maritime Department of the Los Angeles Chamber of Commerce.

Washington authorities have pointed to Los Angeles as a desirable center, economically and strategically, for major shipbuilding in conjunction with the new Federal two-and-one-half billion dollar merchant marine and naval expansion program administered by the United States Maritime Commission and the U. S. Navy.

Climaxing many years of sustained effort grappling with the problem, the Los Angeles Chamber of Commerce board of directors has initiated a program to interest local shipbuilding concerns in undertaking a comprehensive share of this construction work.

President W. S. Rosecrans of the Chamber has designated the writer as manager of the Chamber's Marine Exchange, to bend the chief energies of his department to speeding of these developments, which will mean additional thousands of men and millions of dollars on Los Angeles County payrolls, and will rejuvenate Los Angeles Harbor facilities for merchant marine construction.

An appreciable part of the nation's naval and merchant fleet must be built on the Pacific Coast. In no other way will the full value of national defense and of national economic aspects, as envisioned by the congress and expressed in the Shipping Act-1936, be realized.

Shipyards, and very substantial support of them, are not in anywise a new activity with Southern California or the Los Angeles Chamber of Commerce. In 1916, along with the growth of Los Angeles Harbor, prominent far-seeing citizens, leaders of this community, members of and in cooperation with the Chamber, recognized the need for and established ship repair facilities as a prerequisite to inevitably becoming a world port. The present Los Angeles Shipbuilding & Drydock Corporation yard is the outgrowth. Although they reached their peak as a result of war time contracts, two of the yards, Craig Shipbuilding Company, Long Beach, California, and the Los Angeles Shipbuilding & Drydock Corporation, San Pedro, California, were in existence and operation prior to, and played an important part nationally in, the World War emergency.

The present efficient repair yard of Bethlehem Shipbuilding Corporation on Terminal Island, with its 15,000 ton drydock, succeeded the Southwestern Shipbuilding Company, which came into existence at the outset of the United States entry

Los Angeles harbor is the world's greatest importer of lumber. Here are shown seven vessels unloading simultaneously at one of the nine lumber wharves of the port.

Main channel entrance, Port of Los
ngeles, showing Terminal Island facili-
es at left, and at upper right some of
e large basins and docks of the outer
arbor.

in the war. Since the World War
m cellaneous small craft has been
th sole shipbuilding opportunity for
these yards. Nevertheless, the own-
er to the degree possible under such
ci umstances have carried on even
though the volume of construction
an repair work was far too little
wen related to the size and ability
of the plants. It has been a most
fo unate, if not providential, cir-
cu nstance defensively and econom-
ic ly for the nation that these yards
h e been maintained at all. As a
v y natural consequence of the
m ny years of disuse, much of the
e ipment and facilities are deter-
io ted or outmoded to such a ser-
io s extent that competitive cooper-
at n in the present program is
p ctically impossible without a
v y considerable investment for re-
h ilitation. The nucleus is here,
a given an opportunity, along
w h an assurance of reasonable vol-
u e and price, these yards can and
w l build ships again and take their
p ce in the present emergency.

n its survey of November 10,
1 7, the Commission places the
 me for prevailing conditions
 arely with the national policy
n not with Pacific Coast or other
 builders. Also, in the survey as to
 or on the Pacific Coast, the Com-
 sion stated its belief that, de-
 te lack of building the past ten
 rs, there are available a sufficient
 nber of skilled workmen to un-
 take a conservative building pro-
 m; that there might be some dif-
 ulty as to qualified persons in the higher brackets in both technical and executive branches.

There is no fear locally about either supply or quality of labor. There is much of the skilled, technical and executive variety now employed in other fields which would be immediately available under a program of assured continuous work. The more favorable weather and working conditions, as well as labor relations, of this area will have a considerable bearing. Year around operation is a practical certainty.

There are provisions in the act whereby a ship operator is allowed construction subsidy, operating subsidies and allowances for amortization at minimum amounts. No provision is made for shipbuilders towards financing, moreover, and although largely vitiated by the new allocation provision, Title 5 of the Act limits shipbuilders' profit to 10 per cent.

It is noted that the 6 per cent differential provision of the Act (Section 502-D) in addition to domicile and route restrictions, which definitely limit the opportunity of Pacific Coast shipbuilders, applies to **"construction** or **reconditioning . . ."** The new allocation provision (Section 502-F) provides that the Commission ". . . . may, with the approval of the President, allocate **construction** . . ." This may or may not have a bearing on "reconditioning" of the many transpacific vessels which under the new regulations must be done, and will require an expenditure of a considerable amount of money, to bring them up to present requirements as passenger or cargo carriers. This reconditioning work will probably be done by or under the authority of the Commission.

Constantly watching and fostering local industries and its harbor, and therefore immediately aware of this situation, the Los Angeles Chamber of Commerce wired Admiral Emory S. Land, chairman of the Maritime Commission in Washington, as follows:

"On possibility of your Commission acquiring Dollar Line or other vessels on Pacific Coast and that all such will require reconditioning to conform with new regulations, may we not urge your good offices in allocating such work to those Pacific Coast shipyards planning rehabilitation of facilities in furtherance of your announced construction program? Despite understood liberality proposed toward assisting such yards with construction contracts, unfortunately many years' idleness due to lack of construction work has sorely reduced facilities, making rehabilitation, based on construction contracts alone, very difficult in face of ten percentum profit limitation of the Act."

In a brief filed at the hearing conducted by the Commission in Los Angeles on January 27, 1938, the Los Angeles Chamber of Commerce stated its conclusions and recommendations in part as follows: ". . . . rebuilding of personnel and all other essentials to sound, economic, efficient shipbuilding on the

Pacific Coast can only be attained through a definite long-range program which will assure shipbuilders business in such volume and at such price as will warrant rehabilitation of facilities."

Practically conforming to that recommendation, amendments to the Merchant Marine Act—1936, signed by the President on June 23, 1938, include authority for the Commission, with approval of the President, to allocate construction at **negotiated** rather than **bid** prices, with special regard for providing facilities for national defense at strategic points; such negotiated prices, if in excess of the lowest responsible bid, to be accepted and such excess to be paid by the Commission as part of the national defense.

Out of the total United States merchant fleet of 1422 vessels, of 2000 tons and over, 1305 will be obsolete by 1942. To keep abreast of obsolescence would require construction of 261 vessels each year for 5 years, costing in the neighborhood of $2,500,000,000.

Both the Commission and the Navy's experts, after thorough investigation, have declared that the absolute minimum needs in commercial vessels from a standpoint of national defense—for emergency troop and cargo service—requires 50 vessels a year for the next ten years at a cost of $1,250,000,000. The Commission has said that such will be its minimum program on subsidized construction.

There should now be 75 ships under construction. Actually, and after a year and a half of effort, there are 25 cargo ships and 12 high speed tankers at a cost of $110,000,000 now in process, all awarded Eastern yards.

It is understood that the Commission would insist on shipyards being backed by private capital, but that the setup would be such as to be attractive to private capital; that contracts would comprise 4 or more ships. Thus we have the prospect of construction . . . . "in such volume and at such price as to warrant rehabilitation of facilities."

It is also understood that the Commission will not necessarily favor existing yards. Existing yards should have a decided advantage as to investment necessary to qualify. New yards or proposed new yards, however, which can qualify, are invited and urged to submit bids, and are then eligible to contracts at **negotiated** rather than **bid** prices. This more particularly if existing yards, strategically located, as to national defense, fail to qualify or fail to submit bids. Submission of bid is a primary requisite to negotiating.

Significant of this is the announcement that a group of public-spirited Seattle business men are said to be backing a venture comprising a yard and a graving dock to secure the contract for 4 transpacific liners to cost $5,000,000 each for operation in the Puget Sound-Orient route.

With a naval and merchant ship construction program amounting to approximately $2,500,000,000, and with innumerable other United States flag merchant ships requiring reconstruction, as will make them conform with new regulations, facilities nationally will be taxed. Availability of Pacific Coast yards is imperative. Eastern yards, better qualified as to experience, facilities and finances, should and will do the larger liners and Naval work, and with such alone they will very soon be congested. Smaller, mass production, simpler design ships, such as the C-2, C-3, and tankers, must almost of necessity be done in the smaller yards throughout the country.

By the time new bids are open, Southern California yards, well qualified in every respect, are expected to be in position to bid. In

Entrance to main channel, Port of Los Angeles.

th respect it appears to be the Cmmission's next move.

Passage of the Act in its present fm is evidence of a new national aitude which now recognizes the vue of shipbuilding and ships. The nion as a whole, as indicated by t action of its congressional repre- tatives, has now come to realize:

. That ship construction draws rw and finished products from and ths creates jobs and wealth in all pts of the nation.

. That shipbuilding as an indus- t gives employment to a greater nnber in proportion to cost of prodt, 85 per cent being labor, than does any other industry.

3. That this earning power and consequent spending and buying power, so widely distributed through pay rolls, contributes directly to each and every channel and type of business nationally.

4. That if we are to maintain our position in world markets, and if we are to preserve to ourselves the full value in the process, we must deliver our products on our own ships.

5. That our otherwise powerful Navy is at an almost insurmountable disadvantage without a merchant marine—as an auxiliary—as a second line of defense.

LOS ANGELES MARINE EXCHANGE

Ever since Los Angeles Harbor bcame a major port, a Marine Excange, a self-supporting, non-profit organization, has been operated und the supervision of, and with hdquarters office in, the Chamber o Commerce at 12th and Broadway, Ls Angeles. Broader in scope and nparable in efficiency with simlr organizations at other world prts, factual information with regrd to ships and shipping through s port is gathered and dissemited to all shipping interests, news mdiums, shipping guides, exporters l importers, and to the general blic.

A statistical staff is maintained at United States Customs House to ure a day-by-day, ship-by-ship, l item-by-item record of the forn commerce passing through this teway. Such up-to-the-minute ta, together with other specific ulations of foreign and domestic vement of individual commodis, such as lumber, rubber, silk, d petroleum, are available to all ncerned or interested in the furthnce of ocean transportation and eign commerce.

Located at the harbor entrance at point of vantage 100 feet above sea el on the roof of the six-story unicipal Warehouse No. 1, a lookt station is maintained where six sea-trained lookouts provide a continuous 24-hour watch and service to all shipping interests. Among other equipment used is a powerful Bausch & Lomb observation telescope with which arriving vessels are identified an hour or more before they reach Breakwater Light. Advance notification is thus given to steamship agents, and, as occasion requires, to port pilots, tug boats, federal bureaus, such as United States Customs, Public Health (Quarantine), Immigration, and to other interests.

The watch tower of the Los Angeles Marine Exchange.

Ships arriving after sun-down are communicated with in international code, using the blinker-light system of telegraphy. The six experienced ship men employed as lookouts are expert telegraphers.

Strategically located immediately alongside and to the West of the entrance to the main channel, lookouts can communicate by megaphone with vessels passing in or out of the harbor.

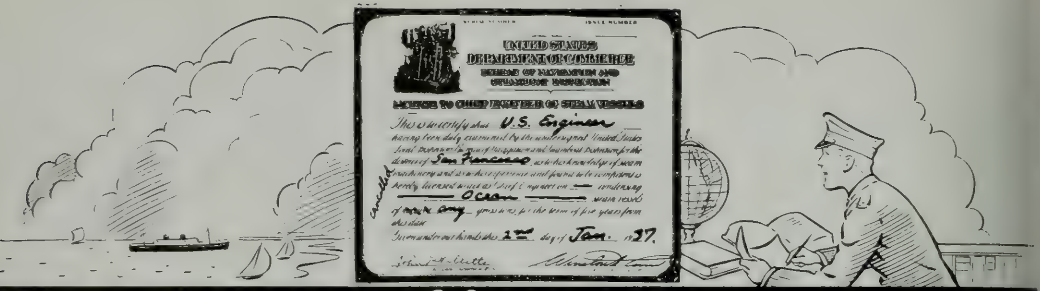
Information pertinent to ship arrivals, intra-harbor movements, departures, casualties, weather conditions, and other maritime intelligence is relayed to all concerned ashore by multiple telephone trunk lines, telegrams, messenger service, and mail, as the necessities of each case require.

A permanent daily log is kept and shows all ships which have touched this port since July 1, 1925.

Atop the lookout station, and along with a flag pole, from which various ships' pennants are flown, is an official United States Lighthouse Service, 1830 candlepower, 300 mm fixed (lightship) red beacon, 110 feet above sea level, and the first sight ships arriving at night have of this port. Under the same jurisdiction other specific aids to navigation are operated, including a synchronized electric bell-siren fog signal.

Under direction of, and in cooperation with, the United States Weather Bureau, the lookouts, using standard meteorological equipment, collect and report complete daily weather data, and display Government weather signals, flags by day and lights by night, from a steel storm-warning tower located on the same warehouse roof at an elevation of 200 feet above sea level.

All shipping and related interests; the Los Angeles Harbor Department and the Los Angeles Chamber of Commerce, contribute financially and otherwise to the service-at-cost operation of the Marine Exchange.


UNITED STATES
DEPARTMENT OF COMMERCE
BUREAU OF NAVIGATION AND
STEAMBOAT INSPECTION
LICENSE TO CHIEF ENGINEER OF STEAM VESSELS
U.S. Engineer
San Francisco
Cancelled
Ocean
any
2nd
Jan. 37.

Your Problems Answered

by "The Chief"

The word "Cancelled" was inscribed on face of the above license at the direction of the Bureau of Marine Inspection and Navigation. As used here it means "Specimen Copy."

On page 37, August issue, in the answer to the question, "What can be done to a good ship with a good boiler and reciprocating engine to increase the power 10 to 25 per cent with corresponding increase in speed?" we notice on return from vacation that "The Chief" got a little out of his depth. He answers: "This has frequently been done. In Europe this system is called the Bauer-Wach system, after the German engineers who first proposed it, but there is nothing difficult or original about it sufficient to warrant retaining the name. The method essentially is to add a geared steam turbine to the engine to take exhaust steam from the engine and expand it to the condenser."

The reference here to Bauer-Wach system is rather crudely in error, since the Bauer-Wach system is patented as such in both Europe and America and widely advertised and marketed under that name on both continents.

Marine steam engineers have understood for many years the advantages of the turbine in the low pressure and vacuum ranges of steam expansion. Parsons advocated combination plants back about 1900. In 1911 the then largest British passenger liner, the Olympic, triple screw, 46,000 gross tons, was built with a reciprocating engine on each outside screw and with both engines exhausting into a low pressure turbine on the center screw.

QUESTION

What is the hydraulic coupling?

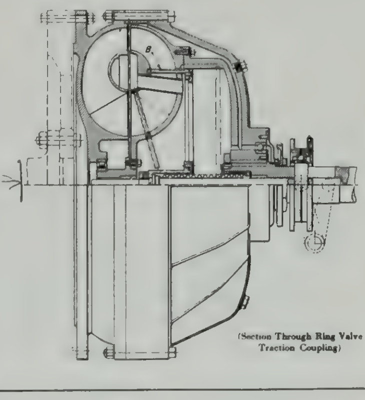
ANSWER

It is the so-called "Vulcan" clutch, formerly used only in European installations but now being manufactured in the U. S. It has an extremely wide variety of uses. It will declutch or separate the driver and driven members. It can be used as a speed reducer at fair efficiency, and as a variable speed connection. They have been built for reversing, but not ordinarily so.

Essentially it is a centrifugal pump and a hydraulic turbine combined. The impeller of the pump takes liquid at the center. It is driven by the driving unit, in this case the turbine, at high speed. It discharges at the periphery onto the vanes of a turbine, where the high these moving vanes. The fluid is then redirected to the center intake of the impeller and thus circulates velocity kinetic energy of the fluid is converted to force and work on around, being used over and over again.

The losses of fluid friction appear as heat in the liquid, and it must be circulated and cooled in large power units. To declutch the fluid is removed. For reduced power and speed only partial quantity of liquid is admitted. Reversing requires another unit built into the same housing.

There are many varieties of these principles. A simple combination is illustrated in the accompanying figures, showing the American Blower Corp. traction coupling. This has a sliding ring which throttles the fluid flow for reduced power and speed. This is illustrative of the principles, but a large marine installation would appear differently.



(Section Through Ring Valve Traction Coupling)

QUESTION

What is the attached generator system and where and why is it used?

ANSWER

The system is now used on the t ee latest Santa boats of the Grace Ine. Arrangement and designs are b the General Electric Co.

The purpose of the system is to s e some of the great quantity of s am normally used for auxiliary prposes. Auxiliary steam on some sips may run as high as 10 to 20 p cent of the main steam, hence a large factor well worth an atnpt to reduce. Furthermore, on t modern passenger ship auxiliary quirements are very high due to lge light, heat and power load, gat use of hot and cold water, and fced ventilation.

The auxiliary load under way has ben a favorite point of attack by s p architects and engineers. For itance, the C. P. & R. steamship Epress of Britain uses diesel enges to furnish auxiliary electric liht and power, and most of the egine room auxiliaries are electric mtor driven.

The three latest ships of the Panaa Pacific Line use steam turbles geared to direct current genetors, and use motorized engine rom auxiliaries, even including the in boiler feed pumps.

Then, of course, there are hundds of plants with almost all engie room auxiliaries driven by sam. It is not so long ago that mst ships had a 10 or 15 K.W. dirt current generator, which was nsidered adequate. Now the fighter wants 50 or 100 K.W. genetors and the ship with electric dk winches will usually have 2 or 3 50 K.W. generators.

The new Navy ships are being quipped with alternating* current gnerators and auxiliaries.

From the very beginning marine dsigners have understood the merit o driving the auxiliaries from the min engine. For instance, on a 300 H.P. reciprocating engine, a 50 H.P. hot well pump, a wet vacuum pmp and other minor pumps could b connected without seriously affting the power output or steam tken from the boiler. Or, more prticularly, the power required for tse auxiliaries would be developed a the efficiency of the main engine itead of at the efficiency of a small egine at ¼ or 1/3 that of the main engine. Who has not seen a walking beam connection from the main engine to some smaller auxiliary?

But good mechanical connections between the main engine and the auxiliaries, particularly with steam turbine main drive, are hard to make. There would be many units where they would be impossible to make. The difficulty is greatly increased when we consider that we must be permitted to suddenly stop, slow down or reverse the main engine, also start up, without bothering the auxiliary driven from it. All these difficult problems have been very neatly solved by the attached generator system.

This system divides itself naturally into the following separate groups for consideration:

(1) The D.C. generator connected to the main turbine, usually direct coupled to one of the intermediate gears of the double reduction gear set. This generator is of adequate size to take care of the auxiliary load as indicated below. It will have an oversize shunt field so that a slight amount of speed variation is permissible, say about 15 per cent below normal, and still be able to deliver normal voltage to the auxiliary bus. This is the attached generator.

(2) A special generator voltage regulator to operate on the generator shunt field, automatically varying it to hold a constant voltage in spite of the varying speed at which the generator is driven.

(3) A steam turbine geared D.C. generator operating or floating on the line, ready instantly to take over the D.C. load if the attached generator should drop it for any reason, particularly due to dropping speed below its allowable limits. The capacity of this generator will be the same as the attached generator.

(4) All of the engine room auxiliaries are D.C. motor driven. This includes the boiler feed pump, the forced draft fans, circulator and all the other regular and special units. The motors for all of these are connected to the bus, being supplied by the attached generator, hence get their power from the main engine through the generator-motor system only as a medium of connection.

QUESTION

How does this system function, particularly in maneuvering?

ANSWER

The ship is equipped with one or two standard geared turbine generators for auxiliary purposes when tied up to the dock. This is necessary to supply the deck winches, cargo hoist, and galleys, as well as all other in-port functions. This would include those engine room auxiliaries necessary while main engines are shut down, such as feed pumps, blowers, etc. Referring to these units as the main generators, we have then the attached generator, which runs only with main engines, and the stand by generator, which floats as an emergency standby for the attached generator.

When the ship is under way, and no further maneuvering is expected, it is in order to transfer the entire auxiliary load to the attached generator. This is done by getting the standby generator up to speed and voltage, and paralleling with main generator, then transferring the load to it. All the load on the auxiliary bus is now being carried by the standby generator. Then voltage on the attached generator is brought up, and when correct its circuit breaker and switch are closed, field adjusted to take load, and field of standby generator is weakened to drop load. A transfer switch is operated which functions to close the solenoid operated valve in the steam supply to the standby generator. This also operates a contactor which short circuits the series field of the standby generator. This all results in this generator slowing down slightly in speed until it motors from D.C. power drawn from the attached generator. It thus continues to motor, driving its turbine at slightly below normal speed. A small amount of steam leaks through to cool the blading of the turbine and seal the packings, as well as keeping it warm for immediate use.

The generator voltage regulator automatically takes hold of the control of the shunt field of the attached generator and holds a constant voltage on the bus, regardless of generator speed, within reasonable limits.

Now suppose the bridge sends down a stop bell suddenly. The engineer need pay no attention to the attached generator at all. He stops the engines. As soon as voltage of the generator falls low enough to effect a low voltage relay, it operates to trip open the steam valve to the standby generator so that it immediately comes up to speed under control of its speed governor. The short circuiting contactor is also opened on the series field. This generator immediately functions, changing from a motor to a generator without jar or disturbance, taking the load dropped by the attached unit. The circuit breaker of the attached unit trips open just as soon as the current in its armature circuit reverses, due to operation of a relay, so that it is now clear of the bus and will not affect the system.

If the main engine is brought up to speed again, the attached generator is **not** automatically cut back on the line again, as this operation is strictly a manual function. The attached generator will not be used again until the engineer decides that the ship has settled down to a steady speed.

QUESTION

What is the reason for the saving in power with this system?

ANSWER

There is, of course, no saving in power with this system. However, assuming the same amount of auxiliary load on two ships, one using the attached generator system, the other using individual steam driven auxiliaries, we have an interesting comparison. It would not be unreasonable to say that one horsepower hour would be developed by the main engine for one-fifth of the steam (hence fuel) from the boiler, that would be used by the small steam units. Assuming that the steam unit ship uses 20 per cent of total steam for auxiliaries, reducing this to 1/5, or 4 per cent, steam additional to main engines to operate auxiliaries, then at an overall efficiency of transmission through the generator-motor system of 60 per cent, the 4 per cent is increased to 7 per cent, or a saving of 13 per cent on total fuel, a factor well worth trying for.

---

*A later article will deal with the merits of D.C. and A.C. for shipboard use.

Engineers' Licenses

The following list shows the licenses granted during the month of July to engineer officers of the merchant marine at Pacific Coast offices of the Bureau of Marine Inspection and Navigation:

Name and Grade	Class	Condition
SEATTLE		
Irving W. Lancaster, Chief Eng.	OMS, any GT	O
PORTLAND		
Adolph J. Hammemann, 2nd Asst. Eng.	OSS, any GT	O
Amund Hansen, 1st Asst. Eng.	OSS, any GT	RG
Eric H. Johanson, 2nd Asst. Eng.	OSS, any GT	RG
Max E. Poirier, 2nd Asst. Eng.	OSS, any GT	RG
Norman W. Carr, 3d Asst. Eng.	OSS, any GT	O
Lawrence W. Mallach, Chief Eng.	OMS, 750 GT	O
William F. D. Dernier, 3d Asst. Eng.	OMS, any GT	O
Clifford R. DuBuque, 3d Asst. Eng.	OMS, any GT	O
SAN PEDRO		
Cecil C. Marrs, Chief Eng.	OMS, 750 GT	O
JUNEAU		
George A. Woods, Chief Eng.	OMS, any GT	RG
SAN FRANCISCO		
Edward D. Griffin, Chief Eng.	OSS, any GT	RG
William R. Diffenbacher, Chief Eng.	OSS, any GT	RG
Donald McQ. George, Chief Eng.	OSS, any GT	RG
Archie J. Reid, 1st Asst. Eng.	OSS, any GT	RG
Francis X. George, 1st Asst. Eng.	OSS, any GT	RG
Eric E. Plep, 1st Asst. Eng.	OSS, any GT	RG
Lycurgus G. Hughes, 2nd Asst. Eng.	OSS, any GT	O
Joseph Vernick, 2nd Asst. Eng.	OSS, any GT	O
Roy G. McQuisten, 2nd Asst. Eng.	OSS, any GT	O
Birger M. Syvertsen, 2nd Asst. Eng.	OSS, any GT	O
Jack F. Curren, 2nd Asst. Eng.	OSS, any GT	RG
Herbert Guelden, 2nd Asst. Eng.	OSS, any GT	RG
Donald R. Malone, 2nd Asst. Eng.	OSS, any GT	RG
Charles Edward Luddy, 2nd Asst. Eng.	OSS, any GT	RG
Paul B. Gray, 3d Asst. Eng.	OSS, any GT	O
Frederick Mischler, Chief Eng.	OMS, any GT	O

Abbreviations: GT is gross tonnage; RG is raised grade; O is original license; OSS is ocean steamer; OMS is ocean motorship.

TRADE LITERATURE

Tube Cleaners, Bulletin Y-3 of the Elliot Company, Pittsburgh, Pa. A 25-page booklet beautifully printed in black and brown on coated paper and illustrated with many fine halftone photo engravings, which describes the construction, operation, maintenance, and care of cleaners for the tubes of heat exchange apparatus.

The Elliot Company manufactures both "Liberty" and "Lagonda" tube cleaners for either water, steam, or air motor drive and with several styles of cutter heads, vibrator heads, and drill heads.

Marine Geared Turbine Efficiencies

By HANS G. BAUER

Marine Engineer, De Laval Steam Turbine Co.

On page 25 of the July issue of Pacific Marine Review, under the caption "Your Problems Answered," certain efficiency figures are given in comparing the respective performances of a reciprocating engine, a double reduction geared turbine, and an electric drive turbine. "The Chief" admits that "the figures may be controversial" and that the questions of relative weights and losses of geared turbine drive and of electric drive must be very carefully treated. In this he is perfectly correct, and in the space allotted it would have been difficult to answer the questions fully.

It is unfortunate, however, that the efficiency figures included in his tabulation were not all based on one and the same specific example, giving the horsepower and propeller revolutions as well as the steam conditions of the various units compared, because without comparable conditions and without knowing what size or type of unit is under discussion intelligent comment is impossible.

For these reasons the comparison between the first and second columns of the tabulation, that is, between the reciprocating engine figures and those relating to a turbine with double reduction gears, is almost meaningless, for, as indicated on page 26, Item 1, different steam conditions are assumed for reciprocating and turbine units, respectively. It would have been possible to compare all three units on an even basis, since an abundance of designs is to be found on the market, and has been for years, wherein comparatively high superheat and high steam pressure have been utilized in reciprocating engine vessels; in other words, steam conditions approximating those widely used in geared turbine equipped tonnage, although the reciprocating steam conditions may be somewhat more conservative than the more extreme steam conditions allowable with steam turbines.

The comparison between the second and third columns also shows a certain inconsistency.

Assuming that both the double reduction geared turbine and the electric drive turbine are operated in connection with identical boiler plants having identical stead conditions, and that both vessels have the same propeller speed and develop the same shaft horsepower, there is no reason why the electric drive turbine efficiency should be 75 per cent while the double reduction geared turbine efficiency is only 70 per cent.

Irrespective of propeller speed, the application of double reduction gears will allow of a turbine speed consistent with maximum turbine efficiency, and certainly equal to a turbine speed possible with electric drive. The only difference between the efficiency of the electric drive turbine and the double reduction geared turbine at full designed normal load would possibly be the windage loss of the astern turbine, and in the case of a compound turbine, the very slight losses in the cross-over pipe. These losses certainly do not justify the difference between the 70 per cent efficiency assumed for the geared turbine and 75 per cent efficiency assumed for the electric drive turbine. As a matter of fact, the general layout of a marine compound steam turbine offers the designers more latitude for obtaining the most efficient unit, since the speed of the high pressure turbine can be run up very much higher than would be possible in the electric drive unit without introducing geared drive in the latter.

The efficiency of 70 per cent given for the geared turbine seems very low unless applied to a comparatively small unit. Reviewing efficiencies offered during the last year or two by well reputed American manufacturers of compound marine steam turbines, we find, **including gear losses,** 73 per cent for a total H.P. as low as 2000, rising to 76 per cent for units developing 7000 S.P.H. per shaft, corresponding to efficiency at the turbine coupling of 75 per cent and 78 per cent, respectively. These efficiencies are based on steam conditions which nowadays can be considered absolutely normal, that is, 375 lb. gage steam pressure, 250° F. superheat, and a vacuum of 28½ in. The most economical electric drive turbines offered within recent years have efficiencies of 75 per cent to 78 per cent, respectively, at the turbine coupling; in other words, quite comparable with those of the geared turbine units. Taking into account the generator efficiency, the overall efficiencies of electric drive main units will be somewhere between 72 per cent and 74 per cent, which is definitely less than the efficiencies of geared turbine units **at the gear-propeller shaft coupling.**

In the cases both of the double reduction geared turbine and of the electric drive turbine, the efficiencies of the transmission have to be considered. This is given in your author's tabulation as 96 per cent for the generator plus cable of the electric drive turbine, and as 94 per cent for the motor. These figures may be very close to what can be expected of a unit of medium to large size, but might be doubtful for units of smaller sizes, say 1500 to 2500 S.H.P. per shaft. In the case of the double reduction geared turbine, the gear efficiency is given as 95 per cent, a figure that is exceeded by all double reduction gears transmitting more than 1500 to 2000 S.H.P. This efficiency should be rather in the neighborhood of 97 per cent for 2000 S.H.P., rising to 98 per cent for larger units. It appears, therefore, that the efficiency of the geared turbine unit, including turbine and gear, will be slightly better than the efficiency of the electric drive unit comprising turbine and generator, so that in any case the efficiency of the turbo-electric drive must be less by the losses of the motor, the efficiency of which will be in the neighborhood of 94 per cent.

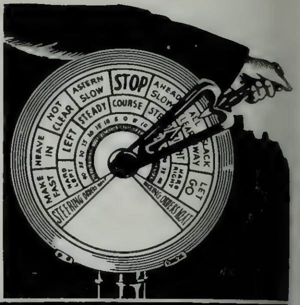
From the foregoing it should be evident, as already pointed out by your author, that generalization is dangerous unless comparisons be made on a basis of identical steam and power conditions.

Unquestionably, an enormous

(Page 58, please)

Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A DEPARTMENT FOR DECK OFFICERS

Some Commendation and a Warning

The following short articles taken from recent bulletins of the Bureau of Marine Inspection and Navigation show that bureau in its true function of friendly and constructive criticism for the betterment of the American merchant marine.

Here is a well-deserved mede of praise:

● Efficiency in Fire and Boat Drill

A report concerning a visit to the S. S. Florida of the Peninsular & Occidental Steamship Co., made by a traveling inspector of the Bureau, indicates that the case of our merchant marine is not as hopeless as some persons might be led to believe.

Emergency drills were held and the promptness and efficiency displayed by the officers and crew in reaching their stations and performing their duties was particularly gratifying and demonstrated that considerable constructive thought had been given to the preparation of station drills and training of the crew. The coxswains in charge of the boats were thoroughly familiar with the proper commands and the handling of boats under oars and in lowering and getting away from the ship's side.

The method of conducting fire drill trained the personnel to combat fires in any part of the vessel. The fourth officer was designated to select the part of the vessel where the assumed fire was to be and he would turn in the alarm on the manual alarm system, no other officer having previous knowledge of the location of the fire. The emergency squad immediately repaired to the scene of the fire in charge of the chief officer. While water was used in as many hose lines as possible as a test, only those nearest the location of the fire were assumed to be used and the entry in the log book covering the drill indicated which streams of water were designated as being used to extinguish the fire.

The maintenance and cleanliness of the vessel further demonstrated the capabilities and efficiency of the officers and crew. All moving gear was in good operating condition even to the dogs on the air ports. A regular oiling schedule was maintained covering every moving part including scupper valves, threaded covers for deck sockets, turnbuckles, blocks, dogs, and nuts on side ports and a continuous record kept.

The logbook entries relating to the drills were in considerable detail in strict compliance with Rule V, Section 18. A note was made of location of fire hoses used at the fire, number of boats swung out and times required. A statement was made of the condition of each group of items such as watertight doors and scupper valves and the condition was entered. After reading a number of entries such as "All equipment OK," which have little or no meaning, it was a pleasure to see such an entry.

The drills conducted on this vessel were in full compliance with the intent of Section 18, Rule V, General Rules and Regulations. Speed and efficiency of the crew clearly demonstrated the practicality of this rule in training and preparing the crew for prompt and intelligent action in emergency.

The Bureau is gratified to receive a report of this nature and believes that the officers of the Florida are worthy of commendation.

Here is the Bureau "cracking down" in no uncertain fashion on a manufacturer who would not play the game straight:

● Articles Used as Stores on Passenger Vessels

Under the provisions of Section 4472 of the Revised Statutes and other applicable sections of the inspection and navigation laws it is the responsibility of the Bureau to make such rulings as are necessary to maintain a reasonable standard of safety in the transportation of cargo known to be of an inflammable, corrosive, or otherwise dangerous character. The law further provides that products of petroleum having a flash point of 110° F. or over can only be carried as cargo on passenger vessels when the route over which it is proposed to trans rt it is such as will not allow of y other mode of transportation hich is commercially practicable. n any other route passenger vessls subject to inspection cannot unr the law carry any refined products of petroleum unless such arles will not ignite at a temperare of not less than 300° F.

Under the above provisions the reau approves various materials d products which are used as res on passenger vessels, such as aning fluids, metal polishes, inticides and other similar articles. e procedure for determining the aracteristics of such products, at esent, is as follows: The manuturer seeking approval of his ducts is requested to submit nples to the Bureau, which sams are in turn forwarded to the tional Bureau of Standards—the icial testing laboratory of the partment of Commerce. There e samples are subjected to tests determine the fire point and sh point together with any other aminations which the nature of material makes necessary. On basis of reports from the Nanal Bureau of Standards covering se tests and examinations, the reau determines whether the maial may be used as stores or nsported as cargo on passenger ssels.

Manufacturers after receiving the ing from the Bureau allowing ir material to be used aboard h inspected passenger vessels ally deemed it advantageous to rk the cans or packages of their ducts in some manner to indie that it has been approved for as stores. However, no stand marking has ever been adopted in some cases the Bureau has nd polishes and similar materials rked improperly and in a misling manner. A particular case this kind again came to the Buu's attention late in 1935, when local inspectors at New York nd that a manufacturer of metal ish was manufacturing two types polish, one inflammable and the er noninflammable, and both rked as such. Included in the rking of both types, however, a statement reading as follows: ay be transported on passenger sels by ruling Steamboat Inspection Service, Department of Commerce."

Examination of the files of the Bureau indicates that this company is an old offender in manufacturing two types of polish, both marked as being approved by the Bureau, one type being inflammable and therefore not in accordance with the approval granted. Correspondence indicates that the company has assured the Bureau from time to time that it would refrain from continuing the manufacture of these dangerous and misleading products.

The company was warned in 1935 that should the inspectors of the Bureau find this inflammable polish marked as cited above, aboard any inspected vessel, the Bureau would take immediate action in withdrawing approval. The company, apparently, did not regard the warning seriously; and in October, 1937, the local inspectors at a port in the second district found cans of a metal polish of the inflammable brand on board an inspected vessel. They immediately notified the Bureau and forwarded samples. After purchasing additional cans in the open market and submitting them for tests, together with the evidence by the inspectors, the Bureau under date of November 1, 1937, notified the manufacturer as follows: "The entire ruling of the Bureau of Marine Inspection and Navigation, dated July 25, 1934, approving * * * is withdrawn and canceled, effective this date." At the same time all the field offices of the Bureau were notified and ordered to take the necessary action to remove such polish from inspected vessels where found.

The Bureau desires the cooperation of all manufacturers and distributors of material of this type in raising the standard of safety aboard American vessels.

It has been the experience of the Bureau over a period of years that polishes, insecticides, etc., used on inspected vessels are placed in the hands of persons who, in the majority of cases, are not as careful as they should be in properly stowing them away. The inspectors find such materials placed in the most unexpected locations. It appears that the personnel concerned desire to have them available immediately in their particular working area. Usually the places of stowage chosen are such as to preclude sufficient ventilation, the lack of which results in the continued maintenance of a temperature which is too high for the safe stowage of any material of a volatile and inflammable nature. When polishes or other materials having a flash point below 300° F. find their way on board inspected vessels the hazard created by their use cannot be considered lightly.

The Bureau hopes that the next 12 months will show considerable progress in the elimination of hazards of this character and the complete standardization of requirements regarding the use of such articles as stores and their transportation as cargo on inspected vessels.

Both of these incidents arise from matters coming directly under the supervision of deck officers in the merchant marine. The Bureau of Marine Inspection and Navigation is keen on having the cooperation and friendship of every right-thinking American merchant marine officer and crew member.

Windjammers for Training

The United States Maritime Commission has acquired two famous three-masted, square-rigged ships for use in its new program for training seagoing personnel of the American merchant marine.

Both ships have had long and romantic careers and have been familiar sights in years past in the harbors of the world. Tusitala has been purchased from the Marine Liquidating Corporation of Fall River, Mass., and Joseph Conrad has been presented to the commission by Mr. Huntington Hartford of New York and Newport, R. I.

Both ships will be stationed, temporarily at least, at Hoffman's Island, New York harbor, the east-

(Page 58, please)

M. S. Komoku

A Sugar Boat De Luxe

Komoku just after launching at Moore

Many old timers watched with satisfaction the trim, businesslike appearance of the motorship Komoku as she performed up and down the bay during her trial trip on August 4. She was designed by T. L. Tomlinson and Captain F. M. Hibbs of the firm of Pillsbury and Curtis, in technical cooperation with Captain Charles White, operating manager, and W. F. Sampson, executive vice president and treasurer, of her owners and operators, the Bay & River Navigation Company. She was constructed under the supervision of T. L. Tomlinson of the firm of Pillsbury and Curtis.

On February 15, 1938, a contract for her construction was awarded the Moore Dry Dock Company of Oakland, California. Her keel was laid May 4, she was launched on June 15, and delivered on August 18. She is classed as a twin screw, steel hull, motor freight vessel for inland water service. Her principal characteristics are given in the table herewith.

The sole object in the design and construction of this vessel was the economic transport of sugar in packages from the refinery of the California - Hawaiian Sugar Refining Corporation at Crockett to various ports on San Francisco Bay and its tributary inland waterway systems.

The hull is of mild steel entirely welded. All plates and scantlines are of weights and dimensions to comply with the rules and specifications of the American Bureau of Shipping for a fully welded vessel of this class. All welding materials and tools used and all welders employed on the hull were approved by the American Bureau and all welds throughout subject to the tests and inspection of that bureau. The entire ship and her equipment was built to the requirements of the regulations of the Bureau of Marine Inspection and Navigation, U. S. Department of Commerce.

● Hull Structure

All framing in the hull is arranged on the transverse system with suitable modification for complete welding of all joints. There is not a single rivet in the structural work of this hull.

Two full transverse water and vapor tight bulkheads are fitted into the hull. One of these, forward of the elevator hatch, serves as a collision bulkhead and also as a strength member of the hull truss. The other bulkhead is located forward of the machinery space and serves to completely separate that space from the hold and to prevent any possibility of any contamination of cargo by engine room gases. This bulkhead is also a strength member to stiffen the stern.

M.S. Komoku on her trial trip, San Francisco Bay, August 4.

Mrs. W. F. Sampson, sponsor, and party at the launching of M. S. Komoku, Moore Dry Dock Co.

enter line and intercostal longi- linal keelsons and deck stringers th widely spaced pillars on the ter line support and stiffen the ors and the deck.

Special framing and stiffening in y of the large elevator well fur- h reinforcements to compensate that large opening.

The welding work on this hull s very satisfactory. No distortion s noticeable in the finished job. calking was necessary on the lds of skin plating. To date she as "tight as a drum" and has not aked a tear." Complete job was ctric arc welding using Lincoln ated Welding rod.

Cargo Handling

As stated above the economic nsfer of cargo is the sole purpose this vessel. All parts of the ship re planned with that end in view. ight will be: prepared ashore in kages of approximately uniform ight; stowed on platforms or pal- of uniform dimensions; trans- red to the platform of the ship's vator by power trucks or jitneys; sed or lowered with the truck or ey to the hold or deck level; and nsferred to the stowage position the truck, which then returns by erse of these processes to get an- er load.

o facilitate this cycle of opera- s the vessel has been built with freight decks and rectangular go spaces with same dimensions clearances for hold and tween ks. The freight elevator (de bed in detail below) was de- ned and installed with ample area of platform and sufficient power to insure quick action with heavy loads. Platform stopped at deck level provides a flush, uniform extension of deck surface for entire width of stowage spaces. There are no obstructions to the passage of trucks in either cargo space except the pillars on center line, and these are so widely spaced that trucks maneuver around them easily. Wooden decks are fitted in both cargo spaces.

Since the lower cargo space has no cross ventilation, and as cargo is to be handled by gasoline driven trucks, two Ilg exhauster fans were installed to draw dead air and exhaust fumes out of this space both for the safety of crew personnel and to prevent contamination of cargo. These fans are driven by electric motors and each fan has a capacity of 3,000 cubic feet per minute.

Topsides above the main deck are of sturdy wooden construction. On the main deck level this wooden house encloses the upper cargo space. On top of this deck house is erected an upper deck house enclosing pilot house and crew's accommodations.

American Marine Paint protects the surface of this hull.

Cargo Elevator

Mainspring of this cargo handling system is the large Barlow Marine Elevator, which is indeed the central structural feature of the entire ship. As one practical naval architect put it, "The Komoku is built around that elevator."

Barlow Marine Elevators are designed and built by the Colby Steel Company of Seattle. The one on the Komoku is among the largest ever installed on shipboard. The platform of this elevator is 12′ wide x 30′ long. It will handle a 6-ton load at approximately 70 f. p. m. and an overload up to 12 tons at from 40 to 50 f. p. m. The platform serves the three decks of the vessel, lower hold, main deck and upper deck, with a total travel of over 20′.

This installation is powered by compressed air at 100 pounds pressure at the engine, which is of a very sturdy double cylinder link motion type. Connections are installed for operating this engine with shoreside steam if necessary. The engine drives a double geared cargo winch with one center drum and brake wheel, and with extension shafts on each side to wing drums. Thus each drum is directly in line with one of the three sets of lifts.

PRINCIPAL CHARACTERISTICS

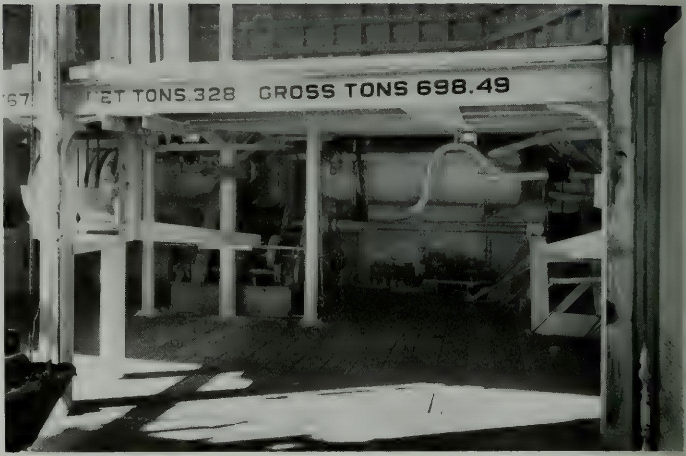
Length overall	188′ 2″
Length between perpendiculars	183′ 3″
Beam molded	40′ 0″
Depth molded	10′ 4″
Depth of hold	7′ 8″
Displacement loaded	1265 long tons
Total deadweight	1025 long tons
Gross measurement	698.49 tons
Net measurement	328 tons
Net cargo normal load (package)	663 tons
Propulsion power, twin screws (total)	550 S.H.P.
Normal service speed	10.3 M.P.H.
Diesel fuel capacity	7341 gallons
Fresh water capacity	1054 gallons
Maximum crew	28

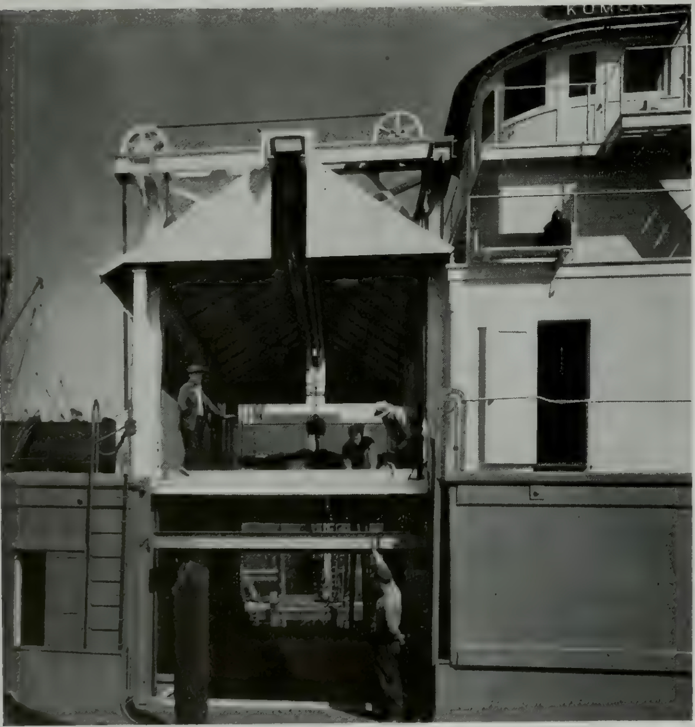
The operator controlling the elevator is stationed forward on the upper deck, where he has a clear vision of all incoming and outgoing cargo. He can stop the platform at any point desired within the range of the travel, enabling him to work directly to any dock or any deck.

A heavy landing apron is provided to span the gap between the elevator platform and the dock over which trucks will be operating.

A unique and special feature of the Barlow Elevator is the telescopic beam arrangement enabling the operator to quickly and safely move this landing apron from starboard to port side, or store same on the elevator platform when the boat is on the run. To support the inboard end of the landing apron, a fore and aft stirrup beam is fitted on each side of the elevator gallows-frame. These beams are adjustable vertically to suit various heights of docks and water levels.

Only one man is required for the operation of the elevator; and to protect the valuable cargo from weather, the elevator is housed in, as will be readily apparent from the illustrations accompanying this article.





TWO VIEWS OF BARLOW MARINE ELEVATOR ON KOMOKU

Upper: Compressed air drive winch which operates elevator. Lower: Side view of elevator from the dock.

● Propulsion Machinery

Two six-cylinder directly reversible marine heavy duty type Union diesel engines drive the twin screws of Komoku. These engines are self-contained units of the four stroke cycle type with 11 inch diameter cyilnders and 15 inch stroke, and each engine develops 275 brake horsepower at 320 revolutions a minute. The crankshaft of each engine is a single steel forging produced at the American Forge Co., Berkeley, Calif.

Each engine has its own cooling water circulating pump, which is also connected to take care of thrust bearings, line shaft and stern tube bearings. Each engine also is fitted with a bilge pump which is connected to the engine room bilges and serves independently of the main bilge pumps.

All engine controls are grouped at a control station between the two engines. This station is equipped with a gage board and an engineer's log desk. The gage board mounts a tachometer for each engine, indicating gages for cylinder pyrometers, air pressure gages and other checks.

Exhaust lines from these engines are fitted with Maxim silencers and with spark arresters. Starting air at 250 pounds pressure is supplied by the compressors mounted on the engines which discharge into two starting air tanks located in the wings of the engine room.

Fuel for the diesel engines is carried in two tanks located in the fore k with a service tank for the in engines and one for the auxil- engines in the engine room. fuel oil transfer pump, located the main engine room is driven an electric motor and can trans- oil from either forward to either ine room tank, or by a shifting onnections can deliver oil from of these tanks or from the lu- ating oil tank to a deck outlet the after deck for discharge ugh hose to a barge or a tank k ashore.

ubricating oil or fuel oil cleans- is handled by a De Laval Uni- tic oil purifier No. 45—a self- tained electric motor drive unit ipped with oil heater, motor ter, and all necessary acces- es.

ll power units in the engine m are guarded by hand rails to complete protection to person- A trolley beam and hoist is in- led over each main engine to fa- ate drawing of pistons and lin- The installation is noteworthy he compact, convenient arrange- nt with ample space around each t to insure ease of routing main- ance and safe operation.

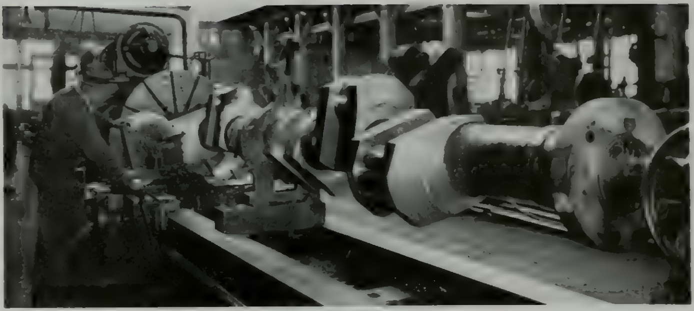
he auxiliary unit for supplying air is a Gardner-Denver two- e tandem water cooled air com- sor direct connected to a 7½ . D.C. electric motor. At 890 m. this compressor delivers per ute 16.4 cubic feet of air at 250 nds pressure. Connections are nged at the switchboard so that ecessary this compressor can op- e on shore current.

pipe line from these tanks ugh a reducing valve supplies pound air to the whistle and to steering engine flask mounted op of pilot house.

uxiliary Machinery

he electric plant furnishes power lighting, heating, ventilating fan ors, the auxiliary starting air pressor, and certain pumps. The ator winch, the steering engine, dlass and certain pumps are op- ed by compressed air.

or electric power duplicate diesel erating sets are installed one on side of the engine room. Each consists of a Caterpillar 31 brake epower diesel with incorporated line engine starting set and di- connected to a General Electric 20 K.W. D.C. generator. This set is a self-contained unit mounted on a continuous bed plate, the engine being equipped with fan, radiator, circulating pump, automatic speed governor, clutch and lever for engaging starting engine and all necessary accessories.


Forged steel crank shaft for diesel engine of Komoku; shown in lathe.

A Trumbull switchboard is installed with two generator panels and one distributing panel. Each generator panel is equipped with switches and gages necessary for independent operation of either set.

For normal operation one set easily takes the load. They will be operated alternately under ordinary conditions or in combination if necessary.

The connected electrical load includes:

Lighting of all spaces
Navigation lights
Searchlight
Ventilating fans in staterooms
Ventilating fans for cargo space
Auxiliary air compressor motor
Fire pump motor
Oil purifier motor
Wesix "Bilt-In" 1000 watt electric heaters for crew accommodations

Voltage is 125 for all circuits.

● Compressed Air Auxiliary Power

Compressed air for operating auxiliary units is furnished by two independent identical diesel driven air compressor sets of the direct connected self-contained type, each mounted on a structural steel bed plate together with radiator, gasoline engine starter set, fan, pumps, and fuel oil tank.

The diesels are 3 cylinder 5¾" x 6" Model D-8600 Caterpillar engines and the compressors are Gardner-Denver 2 stage radial assembly type with 2 low pressure 7" diameter, and 1 high pressure 5¾" diameter, cylinders having a common stroke of 5". Each of these sets is capable of delivering 160 cubic feet of 100 pound air per minute at 875 r.p.m. Delivery is to the two air receiving tanks and/or direct to the elevator winch engine. Capacity of pipe system is 25 per cent in excess of compressor discharge.

● Crew Accommodations

Accommodations for the crew set new standards for Pacific Coast inland water craft. Not more than 2 in a room. Rooms equipped with Simmons berths, Wesix Electric Heaters, ample lighting, comfortable chairs, large Worley lockers and other accessories to comfort.

The galley and mess rooms are large, well ventilated spaces. An oil burning "Superior" steel range furnished by the Bridge & Beach Company, gives the chef ample capacity for cooking, baking and roasting. This range is equipped with a water back connection, hot water from which serves the steam table en route to an 85 gallon insulated hot water tank. Tops of all drainboards and dressers are of shining stainless steel.

Silex electric percolators are installed to insure good coffee. A large Olympic air conditioned refrigerator takes care of galley stores.

All plumbing fixtures are Crane. Most of the pumps are Warren.

● Fire System

A Chas. Cory electric fire alarm system covers the ship. Fire mains with five 2-inch hydrants for hose connection are served by an electrically driven fire pump capable of holding the pressure at 150 pounds with two lines of hose in service.

Traverse City Socony launching

A Modern Gasoline Tanker For Great Lakes Service

The motorship Traverse City Socony, built by the Manitowoc Shipbuilding Company of Manitowoc, Wisconsin, is an electrically welded steel hull tanker of modern design and equipment for Great Lakes service. Her hull has the following principal characteristics:

Length overall—290′
Breadth—49′ 6″
Depth—20′ 6″
Gross tons—2241.99
Net tons—1352
Light displacement—1400 tons
Draft (summer load line)—17′ 2″
Deadweight at 17′ 2″—4375 tons
Cargo tanks—12
Total capacity (gasoline)—1,209,372 gals.
Fuel capacity—25,915 gals.
Speed (cruising)—12.5 m.p.h.
Fuel consumption at 12.5 m.p.h.—100 gals. per hour.

Hull is constructed on longitudinal framing system and is electrically welded in the most modern manner. Watertight and oiltight bulkheads and decks subdivide the hull into 22 watertight compartments, including 12 cargo tanks, 2 ballast tanks, 2 fuel tanks, pump room, engine room, after peak, fore peak, dry cargo hold and cofferdam.

The bulkheads, shell and deck were built as shop sub-assemblies and erected on the building ways. Approximately 1000 tons of steel were used in the construction, necessitating nearly 100,000 feet of electric welding.

• Propulsion Machinery

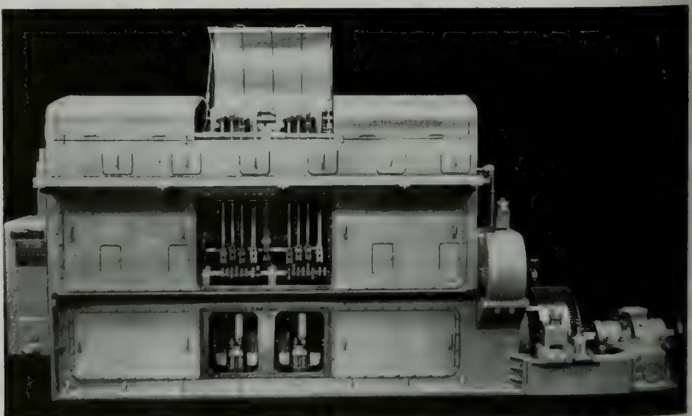
The propulsion plant of this vessel comprises two 6 cylinder, 4 cycle, direct-reversible Nordberg marine diesel engines, each developing 750 H.P. at 300 r.p.m., or a total of 1500 H.P. for the ship. These engines are of 16″ bore and 22″ stroke with mechanical injection of fuel, and are of trunk piston construction, the standard design for Nordberg engines of the 4 cycle type. Each engine is equipped with a Kingsbury self-lubricating, adjustable thrust bearing mounted on rigid beams bolted to the engine bedplate.

The general construction of these engines includes a number of the very important features commonly found with Nordberg designs. Bedplate and cylinder block are tied together with long through bolts, which relieve the castings of tension stresses set up in the operation of the engine and tie the engine into a very rigid unit.

The engines are completely enclosed, and the exterior surfaces are smooth and flat, which aids materially in keeping the units clean. Cam shaft, valve gear, push rods, and fuel pumps are located back of the large removable covers on the front side of the cylinder block, affording great accessibility to these vital parts. By removing the large covers on either side of the bedplate, ready access is obtained to the main and crank-pin bearings.

The entire top of the engine is enclosed with sectional hinged aluminum covers, which can be swung back when desired to afford easy access to the cylinder heads and overhead valve gear parts. Built-in air filter units fitted with silencing walls are installed in the covers on the cylinder block on the exhaust side.

Mechanical force-feed lubricators serve the power cylinders. All other working parts, such as the main bearings, connecting rod bearings,

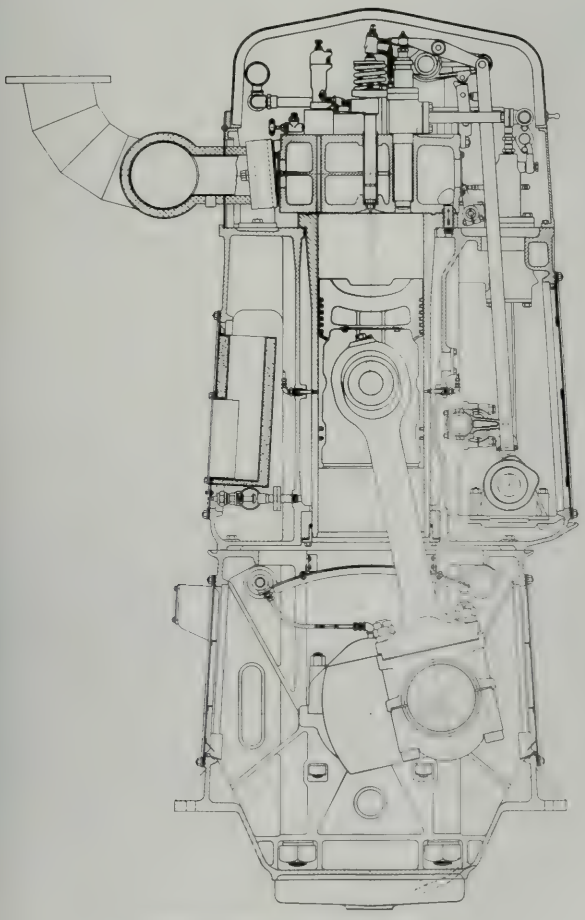


6 cylinder 4 cycle Nordberg trunk piston diesel engine developing 750 B.H.P. at 300 r.p.m.

Tanker Traverse City Socony on trials

cm shaft bearings, and valve actuing mechanism, are served by a cculating force-feed system. No nual oiling of any kind is necessy. This lubricating system is so anged that the lubricating oil retning from the bearings gathers in t sumps located fore and aft of t engine bedplates, and from there idrained to a common sump tank lated in the ship's bottom. From th sump tank the oil is pumped by mans of a separately motor-driven pmp through strainers and an oil coler, and then led to each main bring through the drilled passages i the crankshaft and crank pins to t crank pin bearings, thence tough the hollow connecting rods tthe piston pin bearings. By means tubing and drilled holes oil is also led to the other smaller parts requiring lubrication.

Reversing and control of these engines is unique. Each engine is controlled by a single hand lever mounted on a common central control stand located forward between the engines. When the lever is at its center position the engine is in the stop position. When lever is moved either ahead or astern it starts the engine in that direction and controls the engine speed in accordance with the amount of movement given to the lever. When the lever is in either of the extreme positions of travel the engine will operate at its maximum speed of 300 r.p.m. in that direction. The reversing gear is actuated by an air-operated reversing cylinder in tandem with an oil cylinder. The oil cylinder acts as a governor for the air cylinder so that the reversing of the cam shaft may be made at an even speed. This oil cylinder can be used as a reversing cylinder in the event that no air is available. The movement from the air-operated reverse piston rod is transmitted through a rack which engages gears and turns the maneuvering shaft one revolution. When the maneuvering shaft is thus turned the cam shaft is shifted laterally from the running position in the new direction. This control is positive and quiet and reverses the engine from full speed ahead to full speed astern, or vice versa, in from 4 to 6 seconds. Automatic interlocks are built into the enclosed control boxes and no wrong movement can be made by the operator of the single- control lever. While the speed of the engines within the normal range of operation is controlled by the position of the control levers, each engine is equipped with



Sectional elevation of Nordberg diesel

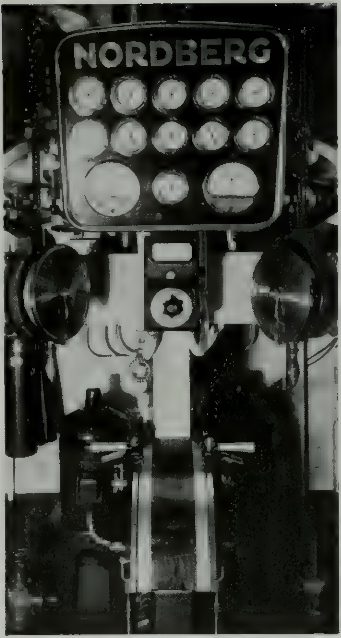
a Woodward marine type overspeed governor, which holds the engine speed within maximum limits.

The cast iron bedplate containing main bearings and completely housing the cranks extends upward to meet the cylinder block, no intermediate frame being necessary. Main bearings have removable two-piece steel shells lined with centrifugally-cast babbitt. The cylinder block and removable liners are made of special Nordberg alloys of cast iron, and heat treated. The cylinder heads are also made of a special cast iron alloy and contain the inlet and exhaust valves as well as the starting valves, all of which are mounted in cages. The exhaust valves are water cooled.

With the engines arranged for mechanical injection of the fuel, each cylinder has its own cam-actuated fuel pump bolted to the cylinder block above the cam shaft and near the cylinder it serves. Each pump can be cut in or out of operation and is provided with a hand priming device.

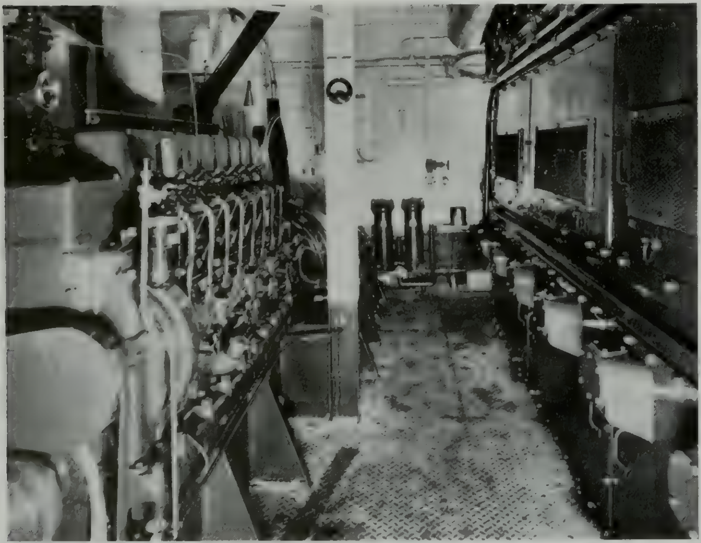
● Auxiliary Machinery

Auxiliary machinery consists of two Fairbanks-Morse 8 cylinder, 4 cycle diesel engines developing 120 H.P. at 900 r.p.m., which are direct connected to 70 KW direct current generators and also through clutches and bulkhead stuffing tubes to the cargo pumps.



Control stand for 2 Nordberg diesel engines on Traverse City Socony.

Below: View in engine room; Nordberg main engine at right and F. M. diesel generating set at left.



Cargo is discharged by two Northern Pump Co. rotary pumps with a capacity of 1460 gals. per minute each. With both pumps in operation a full cargo can be unloaded in approximately seven hours.

A Fairbanks-Morse generator set of 15 KW capacity is used for standby lighting service. For emergency lighting a set of Edison storage batteries are fitted to operate automatically.

All service equipment, such as Benson Electric Co. steering gear and deck winches, American Engineering Co. windlass and capstans, Northern Pump Co. fuel, bilge, fire and water pumps, Worthington air compressors, and DeLaval oil purifiers, are electrically driven. In general the motors for deck machinery are of Diehl Mfg. Co. make and for the engine room equipment are of Fairbanks, Morse & Co. manufacture.

Navigating equipment consists of Sperry gyro compass and rudder angle indicator, Bludworth radio direction finder, Kelvin magnetic compasses, engine speed and direction indicators, electric sounding machine and other equipment of the most modern type.

Cargo spaces, pump rooms and engine room are protected against fire by Lux carbon dioxide system. A fire line capable of supplying water at 125 lbs. pressure at hose outlets and chemical hand fire extinguishers are used to protect other parts of the vessel.

● Crew's Quarters

Insulated and fireproofed living quarters for the crew are provided in the after end of the ship. These quarters are fitted throughout with metal furniture designed and built by L. F. Dietz & Associates.

A Crane Company oil fired steam boiler is fitted in the engine room to supply steam to heating system. Hot and cold running water is supplied to lavoratories in each stateroom and to showers in the bathrooms.

All in all the vessel is the most modern conceivable of its type in construction and equipment and is a distinct credit to its owners and builders.

Diesel Power Unit Replaces 5 Gasoline Engines at Point Arena Lighthouse

After a careful study of the pos- ble added benefits to marine traffic om a proposed increase in power r the Pt. Arena Light Station, the S. Lighthouse Service decided to place five small gasoline engines th a "Caterpillar" diesel D6600 gine. This 60 H.P., 4-cycle, 3-cyl- der unit supplies electric current operate the light and radio bea- ns and for domestic lighting, and mpresses air for the station's fog gnal.

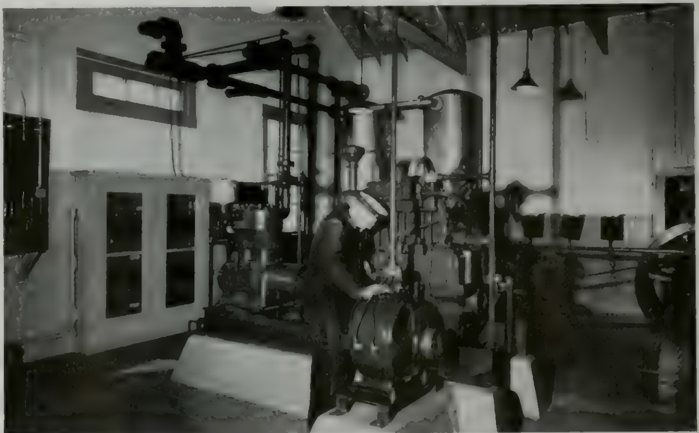
For this latter service the engine direct-connected to a Chicago mpresser and 35 pounds of air are mpressed for the fog signal, hereas with gasoline, 28 pounds s the maximum. This added wer increases the signal's strength the extent that the horn's two sts every 60 seconds are audible o 10 miles.

By means of a pulley on the front wer takeoff, the engine is belted a 6.6 kilowatt Crocker-Wheeler nerator, which supplies power for 390,000 candlepower beacon ht and domestic lights for the ops and the four dwellings at the station. The same generator also supplies power for the radio beacon, thus eliminating three of the five former gasoline engines which were required to operate some 1500 hours per year for this work. The other two gas engines have been left in place for use as standby power in the event of an emergency.

The Pt. Arena light tower is one of the oldest on the Coast. The original tower was erected in 1870 but it was destroyed by the 1906 earthquake, which necessitated construction of the present tower in 1908. The center of the light is 155 feet above water level and the powerful beacon, which is visible 19 miles, flashes white every 20 seconds. This light beacon is synchronized with the radio beacon, which in turn is synchronized with other beacons up and down the Coast. The 200-watt transmitter operates on a frequency of 292 kilocycles and sends dash and dot signals steadily over a 60-second period and then remains silent for 120 seconds. Reports from ships at sea indicate that this beacon has been heard accurately up to 1400 miles away.

Point Arena light tower and station

In addition to the increased power, the Lighthouse Service reports that the new engine is saving 50 per cent in fuel cost over former gasoline power, despite the fact that gasoline and diesel fuel oil cost the same delivered to the lighthouse.



Power plant at Point Arena light station. At left: The fog horn

The Butterfly Map

Octahedral System of Projection

By B. J. S. Cahill, Architect

"Only a stupid world can long refuse to use it."—C. J. Keyser, mathematician.

At the beginning of this century, only two world maps were in common use, the square Mercator and the elliptical Mollweide, the former used in the English-speaking world and the latter in continental Europe.

Vertical Exaggeration or Lateral Distortion

Fig. (1) is a correct map of the British Isles. Now let us suppose that these islands extend from the Equator to the Arctic. In other words, let us magnify them so that they are about five thousand miles in height instead of five hundred, or about the size of North America from Panama to the top of Greenland. Let us then map these enlarged British Isles on Mercator's projection and we have Fig. (2) which shows exactly how the North American continent is vertically exaggerated on this chart. We see at once that we have not a map of portraiture but a caricature because the head is enormously larger than the feet, like the playful pictures of politicians we sometimes see.

Fig. (3) shows the same British Isles actually traced from a Mollweide world map. Its lateral distortion suggests the comic reflections of a twisted mirror. The exaggerations of Mercator are by no means so obvious nor so offensive as the distortions of Mollweide, but for that very reason the illusions of scale, area and direction are all the more insidious and misleading about the new flying routes across the world. A straight line on Mercator from Tokyo to Panama passes right over the Hawaiian Islands, whereas the quick route, one thousand miles shorter, goes over Fairbanks, Alaska, Salt Lake and Galveston. These and dozens of similar illusions can easily be dissipated by consulting a globe, for, to quote an admirable book on projection published by the U. S. Government, "When map and globe do not agree the former is at fault." Neither Mercator's square map nor Mollweide's ellipse come even near agreement with a globe. This can be easily proved by trying to wrap a square or an elliptical piece of fabric around a sphere and make it fit. It can't be done. Obviously we need a world map which "agrees with a globe."

Various attempts have been made to supply this urgent need: star-shaped maps from the Pole which show half the world upside-down; disjointed maps extending above and below the Equator in several dissimilar and unconnectible sections, as well as various other efforts by experts whose mathematics may be meticulously right but whose maps are ridiculously wrong.

All these attempts have failed for one reason only, to wit: They have not been thoroughly worked out from every possible point of view.

The Butterfly map was ten years in preparation (1899-1909), ten years on probation (1909-1919), with eighteen years more devoted to its detailed perfection (1919-1937).

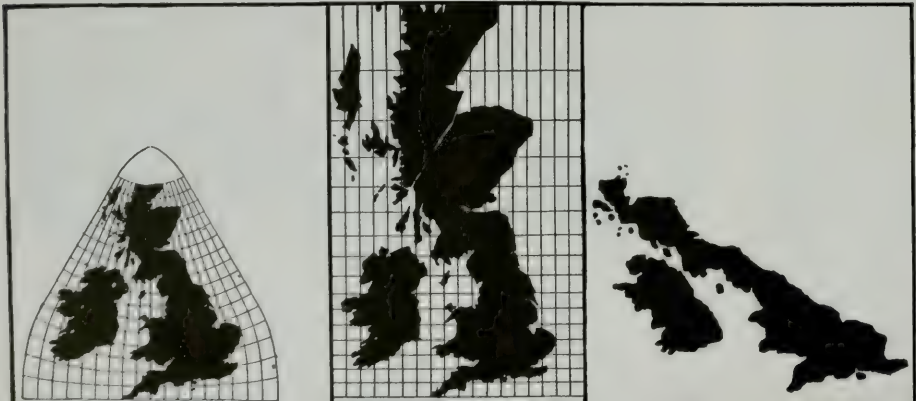
Fundamentals of the Butterfly Map

(1) **Maps of portraiture** (eumorphic) must be distinguished from **charts** of purpose. Mercator's chart was designed to straighten the loxodromic curve so that mariners could sail by a constant compass course. The butterfly Octants are maps, the tetrahedral extensions are charts.

(2) **Decentralization,** or division of the earth's surface into eight parts, is first necessary as in Leonardo da Vinci's Mappemonde of 1513. Most world maps in Nordenskiold's Atlas and Germain's Treatise divide the globe into eight parts by heavy lines. Nature herself works in octaves.

(3) **Articulation** is absolutely necessary. No world map of square, oval or other compact outline can possibly yield agreement with a globe. Huts, igloos, kraals, tents and even temples were originally round, square or rectangular; later in history all buildings became articulated and developed extensions or wings.

(4) **Three Variants** within the general frame are needed to express correct **form, area,** and **direction** since these three attributes of a globe's surface become dissociated on a plane and cannot coexist in one diagram. These are named respectively the Conformal, the Equivalent



Left to Right:

Fig. 1

Fig. 2

Fig. 3

d the Gnomonic Variants, but all ree world portraits closely resem- le one another when their nets are leted.

(5) **Continuity** in many direc- ons secured by revolving a globe to be attained by making the ges of each Octant straight so that ch can be extended indefinitely by e mechanical process of

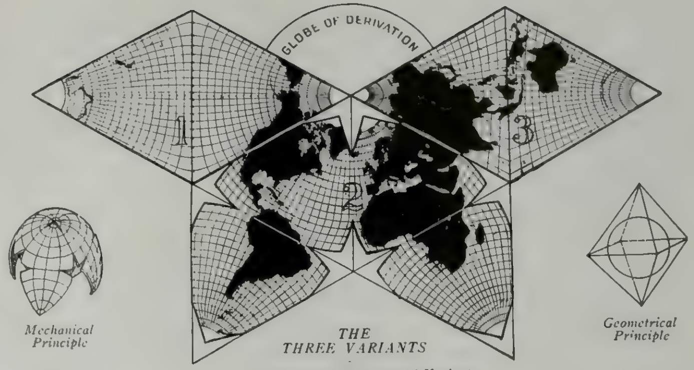
(6) **Replacement** of Octants just actly as the International Mil- nth Map secures continuity by re- acement of eight sheets around y one. To secure this, the Octant ates are merely transposed in the inter's form. By this process the tterfly Map is continuable in from x to twelve points of the compass om each Octant both in oblique d cardimal directions, the latter ing far less useful than the rmer.

(7) **Folding** of the four Southern tants under the Northern ones ings the Austral Hemisphere into e same compact formation as the oreal Hemisphere, another fold ings East and West together, hile a final fold reduces the whole ap to one-eighth its full size. Be- les all-way continuity by “fold- g” in one plane, the same process folding makes it possible to trans- rm every flat Butterfly Map into over a symmetrical solid of glob- ar form with either eight or four- en faces according to the type of riant selected.

(8) **Gnomonic extensions** of each ernate octant to the centers of the ree adjacent ones produces two ts of tetrahedral charts, each cov- ing the whole world and each erlapping the other, yielding eight ge charts on which any line can mechanically extended around e globe. These eight charts en- ged to circles will serve all prob- ns of both aerial and marine nav- ation and geophysics.

The Butterfly Formation

We shall understand the Map uch more easily if we regard it as e unfamiliar “Pattern” cut in two- nensional material, which is to be ded into familiar three-dimen- onal objects. This is in line with e strictly modern and American ethods of quantity production. If e reader does not grasp the idea let him examine toys, cartons, clothes and automobiles, all formed from flat “patterns” of tin, cardboard, cloth or steel which are afterwards soldered, folded, stitched or welded into shape.



1. A quarter of the Conformal Variant.
2. Half the Equal Area Variant.
3. A quarter of the Gnomonic Variant.

The Butterfly Map — Octahedral System of Projection. B. J. S. Cahill, 1899–1934

From the foregoing it will be seen that the Butterfly Map is the only one ever designed which in all possible particulars agrees with a globe.

● Applications and Uses

In the first place it is predicted that when the Butterfly Map is known it will be used one hundred times more often than we now use a world map. This alone practically predicates a new industry as well as a revolution in all the geosophical sciences. And, since maps, like music and mathematics, are internationally understood, it is also confidently predicted that this map will find favor among all the nations of the globe and become, as Le Miroir du Monde of Paris puts it, “The World Map of the Future.”

The orthomorphic variant is the logical map for international meteorology as well as for aviation companies the world over since it is the only Conformal map which covers the whole civilized and traversable globe without any distortion of angles and very little exaggeration of scale.

The orthomeric variant is deliberately designed for all problems of economic geography where areas are to be compared, also for education, commerce, travel and countless other purposes.

The orthodromic variant is valuable for geophysical problems involving direct courses and distances between any two points on the earth's surface.

The original Butterfly sketch map with curved corner cusps as first published, has a special art value in an infinite variety of applications for stained glass, stone, tile, fabrics and jewelry as a symbol, emblem or ornament.

The sudden, almost stupefying, smallness of the modern world—The vast oceans, which formerly seemed to isolate and protect us, now seem “no wider than irrigation ditches.” The very words “far” and “near” have lost their meaning. Moreover, all the land of the world is preempted so that no nation can expand except at his neighbor's expense. Therefore, say some, let us isolate ourselves, mind our own business and arm ourselves to the teeth. This, of course, can only lead to war and perhaps the extinction of civilization. There is a better way suggested by the phrases, mutual understanding, international conciliation and world order, pointing ultimately to permanent peace. To be worthy of this we must learn to “think planetarily,” and as an instrument of service to this end, the Butterfly Map is deliberately and hopefully dedicated.

Spunyarns and Catharpins

Money in Goats

Fortunes are still being made in oil, but you have to start with goats first. Farmer Sam Teas of Olney, Ill., bought three goats for $5. He traded two for a heifer and sold the third for $1. The heifer had a calf and he sold the mother for $35 and kept the calf. One day he traded the calf and $5 for a half-royalty on nine acres of land. Oil was struck on the land and now Farmer Teas sits back and lets the royalty checks pile up on the table in front of him.

"There's money in goats," he says.

—Smoke Rings, S. F. Chronicle.

### In Record Time

He—"I'd go through anything for you."

She—"Fine. Let's start on your bank account."

—Bamboo Breezes.

### An Accident

Teacher—"Percy, why are you crying?"

Percy—"Jimmy kicked me in the stomach."

Teacher—"Jimmy, did you mean to kick Percy in the stomach?"

Jimmy—"Naw, he turned around just when I kicked."

—Windy City Breeze.

Literary Scraps

Proud Oceanic Traveler—"I'm an author! I contribute to the Atlantic Monthly."

Seasick Friend—"Phooey! I contribute to the Atlantic daily!"

Located

A distinguished visitor at a lunatic asylum went to the telephone and found difficulty in getting his connection. Exasperated, he shouted to the operator:

"Look here, girl, do you know who I am?"

"No," came back the calm reply, "but I know where you are."

Just So Navigation

When the cabin portholes are dark and green
Because of the seas outside;
When the ship goes wop (with a wiggle between)
And the steward falls in the soup tureen,
And the trunks begin to slide;
When Nursey lies on the floor in a heap,
And Mummy tells you to let her sleep,
And you aren't waked or washed or dressed,
Why, then you will know (if you haven't guessed)
You're "Fifty North and Forty West".

—Rudyard Kipling.

A Live Wire

A chap was arraigned for assault and battery and brought before the judge.

Judge—"What is your name, occupation, and what are you charged with?"

Prisoner—"My names is Sparks; I am an electrician, and I'm charged with battery."

Judge (after recovering his equilibrium)—"Officer, put this guy in a dry cell."

—Royal Arcanum Bulletin.

Aviation Lubber

A lieutenant flying a seaplane with an AMM flew low toward an aviation field and started what appeared to the bewildered mechanic in the rear seat to be a landing operation approach. By frantic waving of arms, forceful tapping on the shoulder and very definite pointing at the pontoons, he made the officer realize the mistake. A few minutes later the plane was safely landed in the bay.

As the officer climbed out of the fuselage and onto the wing, he grinned and remarked to the now happy mechanic, "For a moment I thought this was a land plane."

Then he stepped off the wing and fell into the water.

Poor Devils

A strange photograph appeared recently in some New York papers. There were five men in it. Not one of them was showing his teeth in that big, hearty smile to which the present era is addicted. One of them had his lips slightly parted, but apparently in anxiety rather than mirth.

Who were these peculiar men? Were they anchorites, gloomsters, professional mourners? No, they were five business men. One was a designer of the building which General Motors is preparing for the world's fair; the four others were officials of the company.

They were looking at the model. They were taking the thing seriously. Their corporation, not the taxpayers, is paying for the building. They have a job of interesting the public, of attracting business, of adding to employment, of paying dividends. So they are not grinners. They make no dental displays in the best Washington manner. They are not on the Federal, State or city pay rolls. Poor, serious devils!

Haitches

"What a large family you have, Mrs. Jones," said an American lady to an English woman.

"Yes'm, and the funniest thing is that all the names begin with an haich. There's Orace, Erbert, Enry, Ugh, Ubert, Arold, Arriet and Etty—all except the last one, and we had her named Halice."

On the Ways -

SHIPS IN THE MAKING

LATEST NEWS FROM AMERICAN SHIPYARDS

Recent American Shipbuilding Progress In Brief Summary

NEW CONTRACTS

oore Dry Dock Co., Oakland, Calif.:
2 lighthouse tenders, U. S. Lighthouse Service; $779,553.

thlehem Shipbuilding Corp., Ltd., Quincy, Mass.:
4—16½ knot cargo liners for American Export Steamship Lines; $10,236,000.

aryland Dry Dock Company:
1 derrick lighter for U. S. Army Engineers; $205,442.

thlehem Shipbuilding Corporation, Ltd., Staten Island Works:
3 U. S. Navy fleet tugs (allocated; no details published).

n Shipbuilding & Dry Dock Company:
1 all welded turbo electric tanker for Atlantic Refining Co.; approximately $2,500,000.

are Island Navy Yard:
1 submarine tender, 9000 tons; estimated cost $12,600,000.

nerican Locomotive Company:
Machinery for the submarine tender; $1,746,000.

get Sound Navy Yard, Bremerton, Wash.:
2 seaplane tenders (1650 tons each)
2 U. S. Navy harbor tugs
destroyer.

th Iron Works:
2 destroyers; $5,067,000 each.

deral Shipbuilding & Dry Dock Company:
2 destroyers; $5,082,000 each.

RECENT LAUNCHINGS

Destroyer DD399, August 27, by Federal Shipbuilding and Dry Dock Company and christened **Lang.**

Fireboat for City of New York, August 27, by Staten Island Works of Bethlehem Shipbuilding Corporation, Ltd.

Submarine Saury, August 20, by the Submarine Boat Corporation, Groton, Conn.

Destroyer Davis, July 30, by the Bath Iron Works, Bath, Me.

DELIVERIES

Jakobson & Peterson, Inc., Brooklyn, on August 31 delivered an 84-foot all welded steel tug.

Tanker Robert H. Colley, August 20, by Sun Shipbuilding and Dry Dock Company to Atlantic Refining Company. 18,500 tons, all welded, turbo electric drive.

S. S. Cavalier, cargo carrier, August 5, by the Pusey & Jones Corporation of Wilmington, Del., to the Philadelphia and Norfolk S. S. Co. of Philadelphia.

News of the Yards

Another Standard Oil Tanker Modernized

Moore Dry Dock Company recently finished a large reconditioning job on the tanker W. H. Rheem for the Standard Oil Company of California.

Work on the structure of the hull involved renewal of all steel where weakened by corrosion, including: the top strake of plating and all stiffeners on center line bulkhead; the top strake of plating on four transverse bulkheads; and all stiffeners between upped and shelter decks.

In addition the crew's quarters were remodeled and brought up to modern Standard Oil practice for comfort and sanitation. A complete new hot water system was installed covering crew and officers' quarters. An interesting feature of the betterment to crew's quarters was the use of Bacite cold set insulating cement in way of decks over boilers, and bulkheads adjacent to uptakes.

Cost of complete job was close to $225,000.

Shipbuilding Contract for Moore Dry Dock

On August 17 the Lighthouse Service of the U. S. Department of Commerce awarded the Moore Dry Dock Company of Oakland, California, a contract to build two steam drive lighthouse tenders of the Hollyhock class at a cost of $779,493. One of these ships is for delivery at Portland, Oregon; the other, at Detroit, Michigan.

The hulls of thes vessels will be of

U. S. lighthouse tender Hollyhock. Contract for two of this type was recently awarded Moore Dry Dock Co.

riveted steel construction and will have the following characteristics:

Length O. A.	174' 10½"
Length W. L.	163' 6"
Beam molded	32' 0"
Minimum depth	14' 6"
Mean draft	10' 7"
Displacement	825 tons

Propulsion machinery will be 2 triple expansion steam engines 11½" x 19" x 32" cylinder diameters and 24 inch stroke taking steam at 225 pounds pressure from 2 oil burning water tube boilers and driving twin screws at 150 r.p.m. with a total I.H.P. of 1000.

A steel mast and boom will be fitted to handle weights up to 20 tons.

Navy Mooring Equipment Bids

Among a group of U. S. Navy equipment bids totaling nearly four millions and opened August 10 were those for supplying and installing fleet mooring equipment at the San Diego operating base. Low bidder was the Southwest Welding and Manufacturing Company of Alhambra, California, with a figure of $385,700. Bid of Koppers Company, Baltimore, was $398,000, and that of Western Pipe and Steel Company, Los Angeles, was $425,553.

Telephone Barge

Pacific Telephone and Telegraph Company, in process of assembling into one unit its present cable laying equipment on Puget Sound, ordered from the Seattle Shipbuilding and Dry Dock Corporation a barge to be 125 feet long, 38 feet high, and 11 feet deep, with a loaded draft not to exceed 3 feet. Living quarters for 22 men are to be incorporated in this hull.

Floating Fisheries Laboratory

An interesting $150,000 shipyard job is the new fisheries laboratory boat now building for the California Fish and Game Commission at the San Diego Marine Construction Company. She will be launched on Thanksgiving morning and christened N. B. Scofield. Her hull will be 100 feet long overall with 24 feet beam. She is to be powered with 2 diesel engines, will have a speed of 10 knots and a cruising radius of 5000 miles. Nickel lined steel brine tanks fitted with coils and instruments for temperature control will be installed and used for research in the transportation of various species of fish. The refrigeration system will include air conditioning of quarters.

Bethlehem Gets Export Contract

As indicated in our "Washington Flash" of the August issue, Bethlehem Shipbuilding Corporation, Ltd., Quincy, Mass., was awarded the contract to build the four cargo vessels for the American Export Lines, Inc. This contract was signed August 16 by J. E. Slater, vice president American Export Lines, Inc.; S. W. Wakeman, vice president Bethlehem Shipbuilding Corporation, Ltd.; and Emory S. Land, chairman U. S. Maritime Commission.

This contract is important in that these four ships are the first of 10 sister vessels to be built by this steamship line under the terms of its operating subsidy contract.

The ships are of a standard design developed by the Export Steamship Company and approved by the U. S. Maritime Commission and the U. S. Navy. They have the following principal characteristics:

Length O. A.	475' 1"
Length B. P.	450'
Beam molded	66'
Depth M. S. D.	42' 3'
Loaded draft	27'
Service speed	16½ knots
Shaft horsepower	8000
Single screw. 2 W. T. boilers.	
Cross compound reduction gear turbines.	
Propeller r.p.m.	96
Steam pressure	425 lbs. gage
Steam temperature	740° F.
Steaming radius at 16½ knots	15,000 miles.
Total dwt. capacity	8,775 tons
Bale capacity	505,000 cu. ft.
Refrigerated capacity	29,000 cu. ft.

American Beauty on the Ways

Campbell Machirery Company of San Diego reports that the 142-foot tuna clipper American Beauty will be ready for delivery about October 1. She will be powered with a 6 cylinder, 600 horsepower Union Diesel Engine and will be equipped with the latest devices for carrying the catch in cold brine.

The Van Camp Sea Food Company is the owner.

Army Engineers Derrick Lighter

The Maryland Dry Dock Company of Baltimore has been awarded a contract for one self-propelled derrick lighter to be 110 feet long between perpendiculars, 30 feet molded beam, and 11 feet 9 inches molded depth, with a load displacement of 438 tons and a loaded draft of 9 feet 2½ inches.

This lighter will be propelled by a single screw driven by a 3 cylinder 16" x 16" Skinner Unaflow 550 I.H.P. steam engine taking steam at 225 pounds from an oil burning water tube boiler.

Keel Laid for U. S. Liner

Keel for Hull No. 369, the twin screw mail, passenger and express cargo liner for the transatlantic rvice of the United States Lines. as laid with appropriate ceremo- es on August 23 by the Newport ews Shipbuilding and Dry Dock ompany. This ship is to be 723 et long, 92 feet beam and 45 feet epth, the largest commercial ves- l ever to be built in an American ipyard. She will be a running ate for the Manhattan and the ashington in the New York- uthampton service.

Admiral Emory S. Land, Chair- an U. S. Maritime Commission, ove the first rivet promptly at :14 A.M. 24 keel plates, stretch- g 660 feet, were already in place r riveting. As Admiral Land, with a riveting gun, took his place amidships, many workmen with guns were scattered along the keel's length. Thus the driving home of the first rivet became the signal for a continuous roar of rivet hammers all along the keel.

Among others witnessing this keel laying were:

Congressman Schuyler Otis Bland, Virginia, chairman House Merchant Marine Committee: Commander Howard L. Vickery, Maritime Commission; A. J. McCarthy, vice-president United States Lines; Rear Admiral Ivan E. Bass and Captain Ross P. Schlabach, both U.S.N.; and shipyard officials.

An Interesting Reconditioning Job at Los Angeles Shipyard

An interesting vessel is the mo- ship Korrigan IV, recently recon- ioned and altered at the Los An- les Shipbuilding and Dry Dock mpany under the supervision of ward B. Egbert of Hough and bert, Inc. Conceived as a Ger- n mine layer during the War, she s on the stocks unfinished in the rds of the Fleusburg Shipbuilding .. Fleusburg, at the time of the mistice. Changed over to a coast- se motorship, she was launched in 20 and christened Erna David. ring prohibition days she was in "rum running" trade under the nes "Zaragossa" and "Principio."

n 1932 her German diesels were laced by 2 Cooper Bessemer 8 inder 400 B.H.P. diesels. Early 1938 she was purchased by the Boleo Company for their Santa Rosalia - Carmen Island - Mazatlan service. Charles Bizet, manager of the San Francisco office, negotiated this purchase.

She was given: a thorough scaling and carefully examined for serious hull defects; a new pilot house and captain's room; and new crew accommodations in the 'tween decks with mess rooms, galley, baths, showers and special lockers. Additional lifeboats and rafts were installed.

The deck machinery was thoroughly overhauled. Four 15 horsepower Cunningham electric winches were added to the cargo handling machinery. The anchor windlass was rebuilt for independent electric drive.

Electrical energy on this vessel had been generated by two 25 K.W. German type dynamos driven by Lister diesel engines. These originally were arranged for grounded circuits using the ship as a common return. In this reconditioning job all wiring and the generators were changed over to the two wire system and a new General Electric switchboard installed.

Main engines were thoroughly overhauled and, although the wear was very slight, new liners and rings were installed.

After a comprehensive paint job she was pronounced fit and was turned over to her owners. Captain V. Erezuma, ranking skipper of the De Boleo fleet, took her out from Los Angeles harbor and she is now on steady schedule carrying mining supplies from Mazatlan to Santa Rosalia and salt from Carmen Island to Mazatlan.

Other ships of the De Boleo fleet are the tanker Argyle and the Providencia, which carries the copper from the mine to the smelter at Tacoma, and carries back lumber from Tacoma and other Sound ports to Lower California.

Coastwise motorship Korrigan IV after reconditioning at Los Angeles Shipbuilding & Dry Dock Co.

Trade Literature

Hagan Automatic Combustion Control, a 16-page beautifully illustrated brochure in blue and gold and handsomely bound in heavy glazed paper describing the modern combustion control for steam boilers as developed by the Hagan Corporation.

As described and illustrated, Hagan Combustion Control: is a product of "skillful engineering"; has "sturdy construction"; serves with "faithful dependability"; gives "continuous performance"; and controls with "unerring accuracy even under the most variable load conditions."

Hagan Automatic Combustion Control is represented in California by the Griffin Chemical Company of San Francisco, who are prepared to render engineering service on Hagan steam plant equipment.

Clyde F. Williamson is manager of the Marine Department in San Francisco, at 1000 Sixteenth Street; and Ray L. Sullivan is in charge of the Marine Department in Los Angeles, at 1925 East Olympic Boulevard.

Building in American Yards

Pacific Coast

BETHLEHEM SHIPBUILDING CORPORATION, LTD.

(Union Plant)
San Francisco

NEW CONSTRUCTION: **Hull 5356—Maury (DD401);** launched February 14, 1938: **completion date about August 5, 1938.** 1500-ton destroyer for U. S. Navy; length, 341′ 3⅝″: beam, 35′ 6⅛″; depth, 19′ 8″.

DRYDOCK AND ROUTINE REPAIRS: **Chipana, D. G. Scofield, J. C. Fitzsimmons, Mauna Ala, Knud Rasmussen, M. S. Vivi, H. M. Storey, Mathew Luckenbach, M.S. South Africa, M.S. Hauraki, F. H. Hillman, Peter Lassen, Frank G. Drum, Capac, M.S. Vilja, Vitus Bering.**

CAMPBELL MACHINE COMPANY

Foot of 8th Avenue
San Diego, Calif.

NEW CONSTRUCTION: **American Beauty, 142-foot brine tuna clipper** powered with 6 cyl. 600 H.P. Union diesel engine, for Van Camp Sea Food Co. Completion date October 1, 1938.

DRYDOCK AND ROUTINE REPAIRS: **Azoreana, Benita, Carmela, Capon, Glory of the Seas, Europa, Invader, Kingfisher, Magellan, Mascot II, National, Olympia, Oceana, Picaroto, Pacific Queen, San Rafael, Stella Di Genova, Sportfisher II, Triunfo, Victoria, Yvonne Louise.**

FELLOWS & STEWART, INC.

Wilmington, Calif.

NEW CONSTRUCTION:

Contract No. 672, 75 foot overall Class "N" sloop. Completion date about October 1, 1938.

Contract No. 673, 41 foot cutter. Delivery date about October 1, 1938.

DRYDOCK AND ROUTINE REPAIRS: **Calif. F. & G. Patrol Boat Blue Fin, Dredge Tender and Tug Gatun, Yachts Melinda, Vellron and Hi-Ball III, Auxiliary Sailing Yachts Hispaniola and Nuova Del Mar; 48 smaller yachts and power boats.**

GENERAL ENGINEERING & DRY DOCK CO.

Foot of Fifth Avenue
Oakland, Calif.

DRYDOCK AND ROUTINE REPAIRS: **Noyo, Tug Arabs, Dredge Olympia, Solano, Gas. S. St. Mary, Barge No. 201, Barbara C, General Frank M. Coxe, M.S. Hawaiian Standard, Esther Johnson, Tug Phoenix, Barges Bonito II, Dolphin II and No. 54.**

HARBOR BOAT BUILDING CO.

Berth 264, Fish Harbor
Terminal Island, Calif.

DRYDOCK AND ROUTINE REPAIRS: **Purse Seiners Kingfisher, White Rose, Chicago.**

HONOLULU IRON WORKS

Honolulu, T. H.

DRYDOCK AND ROUTINE REPAIRS: **Ensley City, Makaweli, Constance Chandler, Marion Otis Chandler, Makua, Maunaloa, Manulani, Golden Cloud, Horda, Steel Mariner.**

LAKE WASHINGTON SHIPYARDS

Houghton, Wash.

DRYDOCK AND ROUTINE REPAIRS: **Yacht El Primero, M.S. Setac.**

LOS ANGELES SHIPBUILDING & DRY DOCK CORP.

Los Angeles Harbor
San Pedro, Calif.

DRYDOCK AND ROUTINE REPAIRS: **Argyll, M.V. Sapporo Maru, Cathwood, Los Angeles, M.V. Thorhild, Cascade, Warwick, Hubert Schafer, M.S. Silverbelle, M.V. Killgrim.**

MARE ISLAND NAVY YARD

Mare Island, Calif.

NEW CONSTRUCTION: **Sturgeon, Submarine** (SS187); keel laid

CRAIG SHIPBUILDING COMPANY

LONG BEACH, CALIFORNIA

Builders and Repairers of Steel and Wooden Ships

Drydock Capacity
2500 Tons

HULL AND ENGINE
REPAIRS

FULLY EQUIPPED
FOR
Diesel Engine Work

DRYDOCK — 12,000 TONS CAPACITY

LOS ANGELES SHIPBUILDING & DRYDOCK CORPORATION
SAN PEDRO, CALIFORNIA - - *Cable*: LASHIPCO

Oober 27, 1936; launching date March 15, 19; **estimated delivery September, 1938.**

wordfish, Submarine (SS193); keel laid Oober 27, 1937; estimated delivery date Aust 1, 1939.

rder received for construction of two haor tugs, YT 133 and YT 134, dated Oober 7, 1937.

arbage Lighter (YG 21); keel laid July 25 1938.

rder received for construction of one sarine tender, Fulton (AS 11); dated Ju 30, 1938.

Order received for construction of one submarine, Tuna (SS 203); dated June 30, 1938.

DRYDOCK AND ROUTINE REPAIRS: **Memphis, Quincy, Portland, Boggs, Lamberton, Drayton, Flusser, Lamson, Mahan, Moffet, Porter, Bridge, Kalmia, Whitney, Altair, Argonne, Lapwing, Oriole, Turkey, Grebe, Tarpon.**

THE MOORE DRY DOCK CO.

Oakland, Calif.

NEW CONSTRUCTION: **Hull No. 192, Komoku, bay and river freighter** for Bay and River Navigation Company. Length molded 182′ 11½″, breadth molded 40′ 0″, depth molded 10′ 0″; twin screw; powered by Union diesel engines of 275 H.P. each. Contract date February 15, 1938; keel laid May 4, 1938; launched June 15, 1938; **delivered August, 1938.**

DRYDOCK AND ROUTINE REPAIRS: **Moveria, S. C. T. Dodd, Golden Horn, Arizonan, Angel Island, Sea Maid, Sea Queen, W. S. Rheem, Puerto Rican, Coya, Lena**

(Page 60, Please)

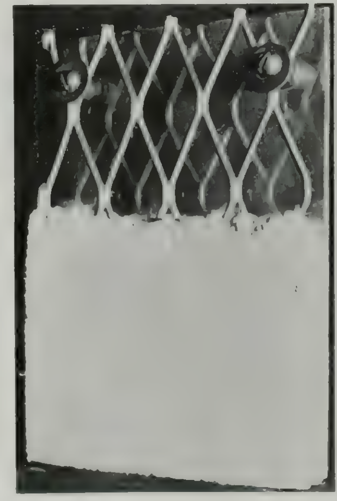
Bcite Cold Set Insulating Cement

new insulating product was reetly developed at the main laborty of the Bird-Archer Co., well kwn boiler feed-water chemists.

his new material is known as ite Cold Set Insulating Cement n is a refinement of the original Bil-Archer Bacite Cement, which s sed on hot surfaces.

s the name indicates, this product embodies a new, very essential and practical principle—completely ring and setting without the apation of heat, and can be applied at temperatures above freezing to 3 degrees.

his cement has the characteristic ictive evaporation of the plastic s which leaves the Bacite coat- dry, with great adhesive force veen the fibers. It forms a rigid lation wall of structural strength sufficient to withstand all normal vibration, and a surface which is smooth and attractive. The surface may be left in its natural white finish or painted with water or oil base paints or with aluminum.



Developed for the insulation of living quarters aboard ship, it provides a new comfort by preventing the entrance of excessive heat. It has been applied on many of the latest tankers to the engine room and fire room casings and underneath decks, adjacent to quarters as well as on ship's side in living quarters.

Bacite Cold Set Cement is usually applied 1 inch or thicker in accordance with special needs. An expanded metal lath foundation is spot welded to the bulkhead at a distance of ½″ or more away from same; the cement is mixed with water and troweled through the mesh to the required thickness and finish. Any accidents to the Bacite coating may be quickly repaired with a small amount, which will dry and adhere to the original coating. Bacite is odor-proof, fireproof, soundproof, vermin-proof, and does not "flake" or "dust" off.

SAFETY ON SHIPBOARD

A Section Devoted to the Creation of Safety Consciousness and Accident Prevention

A PREFATORY WORD

As has often been emphasized by safety workers, the largest variable element in accident prevention work is the personal element—the old "human equation." Statistics show that in the marine industries approximately 3 per cent of the accidents are due to failure of equipment and the other 97 per cent to failure of the personnel. It would therefore appear that safety education which would make the personnel safety-conscious is the greatest need in producing safe working conditions aboard ship and on the docks.

The A-B-C of such education lies in such slogans as Always Be Careful — Safety First — Keep Cool — Watch Your Step.

The practical value of such education can only be attained through constant instruction addressed to both ear and eye. This new department of Pacific Marine Review is addressed to executives and officers of the American marine industry in the hope that a steady diet of accident prevention condensed from the best current literature on the subject may create a more comprehensive state of safety consciousness among the leaders and the workers of that industry.

CARELESSNESS AND ACCIDENTS

In preparing reports on accidents, always avoid so far as possible the use of the easy word "carelessness" as a convenient, cryptic cause for the accident. As is pointed out in a recent article in the American Mutual Magazine, this word "frequently more correctly classifies the attitude of the investigator than defines the cause of the accident. To be sure, most accidents are the result of someone's carelessness, but the implication in that report places the fault upon the injured workman. If not his, whose carelessness was it?

"There are three direct responsibilities attached to each and every operation, and the worker bears but one of these, The management, and the supervision, are the other two. No thorough accident investigation, made by a competent person, who reports honestly his findings, fails to find and to report the contributions which management and supervision made to the failure of the operation, that is, to the accident."

● Avoidable Accidents

Marine Safety, the bulletin of the marine section of the National Safety Council, gives the following accounts of recent marine accidents with comments thereon:

Stand Clear! An A. B. went aloft to lower a large gangline block. Several men were working below. In making a line fast to the block to lower away, it suddenly dropped and struck one of the men a glancing blow on the back as he attempted to dodge out of the way, causing serious injury.

Always stand well clear when heavy objects like cargo hose, package freight, machinery parts, etc., are being lifted. No telling when something is liable to let go. Also, avoid working directy under men who are working aloft as they might accidentally drop tools, block, etc., that they are working with. Chief mates, 1st assistants, boatswains and any others supervising this type of work—**Keep your men in the clear.**

Stevedore Is Killed. A stevedore was in the hold of the ship engaged in making slingloads of raw sugar in burlap bags. A sling-load being hoisted caught under the hatch coaming and the rope parted under the continuing upward pull, the load dropping upon and killing the workman.

The following were found by the investigating committee to be contributory to the accident: The hatch signal-man or winch operator, or both, failed to observe that load was not clear of the hatches or failed to observe and heed signals; there was undue haste to finish the unloading in order to make room for another ship; sling, though new and apparently perfect, was deemed unsafe by a cordage expert in that the heart was broken and strands protruded; the hoisting hook load bearing surface was insufficient for the size of the rope.

As a remedy for these conditions, the committee recommended more frequent inspections of slings; hooks be designed with greater bearing surface and of a shape that will obviate catching in objects while being hoisted; the holding of winchmen, hatchmen and gang bosses responsible for the safety of the stevedores.

Engineer Blinded. The engineer of a refrigeration plant was making his regular inspection of the aqu ammonia pump, as he had done for a dozen years. The bonnet stuck and when he tapped it with a cape

Dependable
Insurance
Since 1863

Fire · Automobile · Marine · Casualty · Fidelity · Surety

FIREMAN'S FUND GROUP
Fireman's Fund Insurance Company — Occidental Insurance Company
Home Fire & Marine Insurance Company
Fireman's Fund Indemnity Company — Occidental Indemnity Company

Strength
Permanence
Stability

New York · Chicago · SAN FRANCISCO · Boston · Atlanta

hel and hammer, ammonia flew in his eyes. Had the nuts not been enrely removed, the jarring of the bnet would have allowed the pressu to escape gradually. But this ca was especially distressing, becase the engineer had lost his right y in a previous accident, and now th left one is also gone. It is hard to nderstand how such a man, with su an experience, could have neglecd to follow the plant safe practic and wear the goggles or mask th were provided and easily availab.

ome Statistics for Dock ccidents

ongshoremen and **Harbor Workers** reported a total of 3338 injuries ung May, 1938. This total ines 3324 nonfatal and 14 fatal inues. A comparison of the nonal and fatal injuries reported during May, with those reported the previous month, shows a decrease of 14 nonfatal and an increase of 5 atl injuries during May. Nonfatal injries during May numbered 766 es than during the same month in 19, and fatal injuries showed a dese of 4.

ongshoremen reported 1749 nonal and 10 fatal injuries during , which is an increase of 168 ofatal and an increase of 4 fatal ijries over the number reported ng April.

epairmen reported 1575 nonfatal n 4 fatal injuries during May, reenting a decrease of 317 non and an increase of 1 fatal in compared with the number reed during April.

Causes of Nonfatal Injuries

Longshoremen. Four main causes of injuries were responsible for approximately 75 per cent of the 1749 nonfatal injuries to longshoremen reported during May, 1938. Handling objects continued as the greatest hazard and caused 546 injuries. Falling objects caused 327 injuries; moving objects accounted for 234 injuries; and falls of persons caused 204 injuries.

Repairmen. Seventy per cent of the nonfatal injuries to repairmen were due to 5 principal causes of accidents, as follows: flying objects caused 489 injuries; handling objects, 252 injuries; conflagration and flames, 134 injuries; falling objects, 117 injuries; and falls of persons, 103 injuries.

Causes of Fatal Injuries

Longshoremen. The cause of 4 of the 10 fatal injuries to longshoremen was drowning. Falls of persons and falling objects were each responsible for 2 fatal injuries; handling objects caused 1 fatal injury and machinery caused one.

Repairmen. The 4 fatal injuries to repairmen during May were due to the following causes: conflagration and flames, handling objects, moving objects, and drowning.

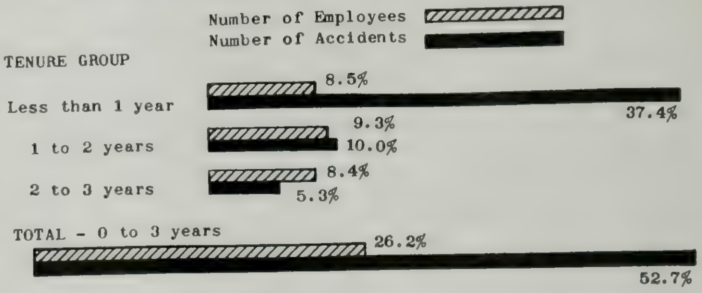
The New Man

The following statement with its chart is quoted from the Union Oil Company "Safety Topics":

"An analysis of all accidents in the sales department during 1937 as compared to the length of service of the injured employee indicates clearly that the "new man" is still the major problem.

"The chart herewith shows the percentage of all accidents as compared to the percentage of all employees in each tenure up to three years service. This record indicates that only 26.2 per cent of all employees come within this classification, but you will note that this group is accountable for 52.7 per cent of all accidents. 37.4 per cent, or over two-thirds, of these injuries are caused by new men, with less than one year's service and training. Analyze this chart carefully.

"Accident prevention is a cooperative job. The more each one of us does to assist the other fellow, the safer we make things for ourselves."



Marine Insurance in All Phases — "All Risks" . . . Inland Marine . . . Ocean Marine

STANDARD MARINE INSURANCE COMPANY, LIMITED
NATIONAL UNION FIRE INSURANCE COMPANY
MERCANTILE INSURANCE COMPANY OF AMERICA

GEO. E. BILLINGS CO.

Pacific Coast General Agents—Richard J. Lutich, Marine Manager

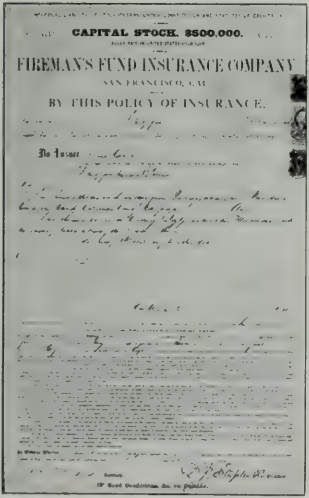
GArfield 3646
308 California St.
SAN FRANCISCO

TRinity 1521
Spreckels Bldg.
LOS ANGELES

SEneca 1478
Colman Bldg.
SEATTLE

MARINE DEPARTMENT
AETNA INSURANCE CO.
QUEEN INSURANCE CO.
MARITIME INSURANCE CO., LTD.
FIDELITY PHENIX FIRE INS. CO.
Commercial Hull Dept.
AUTOMOBILE INS. CO.

MATHEWS & LIVINGSTON
Marine Underwriters
200 BUSH ST. SAN FRANCISCO
Offices at: Colman Bldg. - Seattle 111 West 7th St. - Los Angeles



CAPITAL STOCK, $500,000.

FIREMAN'S FUND INSURANCE COMPANY

SAN FRANCISCO, CAL.

BY THIS POLICY OF INSURANCE.

An Old Pacific Coast Policy

Above is the oldest extant policy of Fireman's Fund Insurance Company. The company's number one policy, insuring 5000 gallons of Boston syrup in storage at San Francisco, was destroyed in the 1906 fire and earthquake. The above policy, which is now in possession of J. B. Levison, chairman of the board, Fireman's Fund Group, was written on the frame dwelling and contents of a general store at Camanche Camp in 1867.

This is the only document in the company's possession signed by D. J. Staples, as vice-president. Two days after signing this policy he became president, and for a third of a century guided the company's destinies with the forthright vigor of a typical two-fisted California pioneer.

C. J. Stovel, San Francisco insurance man, found this historica document among old papers belonging to his father-in-law, James L Martel, one of the pioneers of California, and gave it to Mr. Leviso in recognition of Fireman's Fun 75th anniversary.

Recent Changes of Masters

Marine Exchange, San Francisco

Steamer Arizonan: C. T. Gaidsick; vice, H. W. Dowling.
Steamer Munami: A. T. Swanson; vice, C. F. Wifstraud.
Steamer S. C. T. Dodd: G. Johnson; vice, H. Williams.
Steamer Arkansan: Paul R. Jones; vice, R. A. Oliver.
Steamer Manini: C. W. Saunders, Jr.; vice, S. G. King.
Steamer Panaman: O. L. Thomson; vice, J. A. Gaidsick.
Steamer Tulsagas: R. W. Kelly; vice, Maurits M. Melan.
Steamer Point Lobas: Peter E. Odeen; vice, J. Tobiassen.
Steamer Frank G. Drum: P. M. Gadeberg; vice, F. J. Humphrey.
Steamer Katrina Luckenbach: Harry A. Krum; vice, E. Greene.
Steamer Lurline: G. A. Berndtson; vice, K. Hubbenette.
Steamer R. J. Hanna: James S. Christenson; vice, R. M. Melbye.
Steamer Arizonan: H. W. Dowling; vice, C. T. Gaidsick.
Steamer Point Brava: E. H. Phillips; vice, G. Hagberg.
Steamer Coast Miller: Eric A. H. Watkins; vice, L. A. Rasmussen.
Steamer J. A. Moffett: H. O. Bleumchem; vice, Thomas A. Hill.
Steamer Panaman: J. A. Gaidsick; vice, O. L. Thomson.

Running Lights of Pacific Shipping

LARENCE HENRY MATSON

CALIFORNIA C. McMILLAN

GEORGE B. McLEAN

Clarence Henry Matson, manager,
.epartment Foreign Commerce and
ipping of Los Angeles Chamber
Commerce. Formerly secretary-
affic manager, City of Los Angeles
arbor Department. Born in Ohio.
ewspaperman at start of career. In
ine this year Dr. von KleinSchmid
U. of Southern California con-
rred upon him honorary degree of
aster of Foreign Trade. Came to
s Angeles in 1907 as feature
riter . . . specializing in study of
ansportation problems. One of the
unders of Foreign Trade Club of
uthern California. Married; he
s two daughters, two sons, one of
em a minister. Lives in Pacific
lisades. Grows very beautiful
wers. A leading force in the de-
lopment of the Los Angeles har-
r for 30 years!

California C. McMillan, after forty years with the Coast Guard service, has retired from his post in San Francisco.

He was born in 1874 in Los Angeles, and went to school there and in Berkeley, later serving an apprenticeship at the Union Iron Works in San Francisco.

He went to sea with the U. S. Navy during the Spanish-American War, at the conclusion of which he joined the American Merchant Marine and at one time was on the old Oceanic liner Sonoma. In fact, he came out on her in 1900 through the Straits of Magellan as third assistant engineer.

Capt. McMillan entered the U. S. Coast Guard service in 1902 and was in this service ever since. He has served on every station maintained by the service.

At the time of his retirement—July 31—he was division engineer for the U. S. Coast Guard in San Francisco.

George B. McLean, Port Engineer for Union Oil Company of California, is a native of Aberdeen, Scotland, where he served his apprenticeship as a machinist. On the completion of this preliminary training, he went to sea and finally secured his chief engineer's papers. Before attaching himself to Union Oil Company, he had also served as chief engineer of a large power plant, and later as a foreman in the Bethlehem Shipyards at San Francisco. He was engaged by Union in 1919 to take charge of a marine repair shop operated by the company at Wilmington. In this capacity he displayed a thorough knowledge of the business, and supervised the operation of the plant so capably that when it was abandoned in 1923, he was appointed Port Engineer, and has continued to discharge the duties of that post efficiently until the present time.

Propeller Club of California To Sponsor School Ship Rites

Kenneth W. Ingraham heads up the School Ship Graduating Exercises committee of the Propeller Club of California which has been working diligently for several weeks on the details in connection with this impressive event scheduled for Friday, September 2nd.

With the close cooperation of Pacific ship-operating lines, through the directorate of the Pacific American Steamship Association, and through the courtesy of allied industries, prizes have been assembled for award to the graduates, as follows:

Deck Department Cadets

- First prize—Sextant
- Second prize—Pair of Binoculars and Stop Watch
- Third prize—Stop Watch

Engine Department Cadets

- First prize—Set of Engineering Hand Books and a kit containing a set of Micrometers, Slide Rule, Drawing Set and Set of Feelers
- Second prize—Set of Engineering Hand Books and Slide Rule and Drawing Set
- Third prize—Set of Micrometers.

A plaque is being donated by the California State Junior Chamber of Commerce to the graduate contributing most to the welfare of the School Ship during the year. This plaque will remain aboard the ship and each year an inscription of the name of the graduate adjudged to be most meritorious for this honor will be added.

Chairman Ingraham's committee, working in close collaboration with President **C. M. LeCount**, is **Cyril L. Meek** and **Eugene V. Winter**. Invitations have been extended to the entire membership of the Propeller Club to attend the graduating exercises which will be held in the Pacific Gas & Electric Company's auditorium at 245 Market Street, San Francisco, at 8 p.m. on September 2nd.

The program as arranged by the Propeller Club as sponsors will follow this routine:

Address of Welcome: C. M. LeCount, President, Propeller Club of California.

Invocation: Commander George S. Rentz, U.S.N., District Chaplain of the 12th Naval District.

Address: "A Message to Graduates" by Roger D. Lapham, Chairman of the Board, American-Hawaiian S. S. Co.

Solo: Marsden Argall, accompanied by John Seltenrich.

Prizes Awarded: By an Executive of the Pacific American Steamship Association.

Address: Walter F. Dexter, Director of Education and Executive Member of the Board, California Nautical School.

Presentation of Diplomas and Licenses by: Robert B. McPherson, Chairman of the Board, California Nautical School, and Captain N. E. Nichols, U.S.N. (Retired), Superintendent - Commander Training Ship "California State."

Song by: Graduating Class.

* * *

State of California
California Nautical School
Board of Governors

Robert B. McPherson, Chairman—Vallejo.

Walter F. Dexter, Executive Member and Supt. of Public Instruction—Sacramento.

Robert H. Fouke, Vice Chairman—Berkeley and San Francisco.

Robert Henderson, Captain U.S.N. (Ret'd.)—Los Angeles.

Robert S. Abernethy—Oakland.

J. C. Smith, Secretary—San Francisco.

* * *

Officers
Schoolship "California State"

Captain N. E. Nichols, U.S.N. (Ret'd.) — Superintendent - Commander.

George Barkley—Executive Officer.

R. C. Dwyer—Chief Engineer.

Edwin C. Miller—Watch Officer.

Bennett M. Dodson—Watch Officer.

Ralph M. Sheaf—Watch Officer.

David Warwick — Watch Engineer.

John G. Ellis—Watch Engineer.

Cyril G. Hansen — Watch Engineer.

J. M. Cadwell—Supply Officer.

* * *

Graduating Exercises Committee
Propeller Club of California

K. W. Ingraham, Chairman

C. L. Meek E. V. Winter

* * *

Officers
Propeller Club of California

C. M. LeCount—President.

Chas. E. Finney—Vice President.

Board of Governors: George A. Armes, Henry H. Blackstone, H. H. Brann, Joseph J. Coney, Bern De Rochie, Erik Krag, C. L. Meek, Herman D. Nichols, Geo. E. Swett, Walter J. Walsh, L. L. Westling, Harold L. Weule, Stanley E. Allen.

Propellers to Golf!

Chairman E. F. Essner of the Propeller Club of California Golf Committee announces that the Propeller Annual Golf Championship will be held at the Olympic Club at Lakeside, San Francisco, on Thursday, October 6th.

Arranging the "greatest golfing classic" in the history of the peppy Propeller clan Chairman Essner has as his committee—**Vernon Showell, Frank dePue, Julian Arnst** and **Carroll Reeves.** Each of these committeemen is hardworking and experienced in golfing entertainment and technique.

Four flights for members and two flights for guests are on the big October 6 schedule and already it is interesting to know that a record turnout will occur. Unusually attractive prizes are at stake with the accompanying prestige and glory.

OUTHERN CALIFORNIA TO HAVE $9,000,000 YACHT HARBOR

The Los Angeles County Region- Planning Commission has just mpleted the plans and a detailed rvey for a large yacht and pleas- e boat harbor to be located at aya Del Rey and Venice, Califor- a. It will be known as the Playa l Rey Yacht Harbor Project.

William J. Fox is Chief Engineer the Los Angeles County Regional anning Commission and **George Nicholson** has been retained as nsulting Engineer for the project. r. Nicholson was former Chief En- neer of the Ports of Seattle and s Angeles and at present is Con- ltant for a number of Pacific ast Ports.

E. F. R. DE LANOY

After a vacation and business visit to Europe, E. F. R. de Lanoy, general manager on the Pacific Coast for the Holland-America Line, has returned to his headquarters at San Francisco. During the course of Mr. de Lanoy's trip he discussed with company officials the future policies of the line for West Coast service, when it was announced that service will be improved as fast as business warrants.

R. D. HOULIHAN

Effective on September 1, R. D. Houlihan, head of the finance division of the U. S. Maritime Commission, has resigned his post to return to private business. No successor has been named to fill the vacancy.

The Santana, 55-foot staysail schooner owned by W. L. Stewart, Jr., vice-president of Union Oil Company, which was the first schooner to finish in the 1938 ocean race to Bermuda. The Santana is the first Pacific Coast boat to compete in the annual ocean yacht racing classic staged by eastern Corinthians. She was eighth in Class A on corrected time.

W. L. Stewart, Jr., vice-president of Union Oil Company and owner of the schooner Santana. In West Coast waters, Mr. Stewart is known as commodore of Los Angeles Yacht Club.

CAPT. HAROLD L. WINLSOW

On August 3 Capt. Harold L. Winslow passed away in New York.

He was born in Quincy, Mass., in 1893 and got his nautical training at the Massachusetts Nautical School, and when the World War broke out joined the U. S. Navy in 1914.

On being mustered out he joined the United States Lines in 1922 as fourth officer on the President Polk.

His first command came to him in 1934 as master of the American Pioneer Line steamer New Orleans, then the American Banker, the American Traveler and the President Harding.

In August, 1936, he succeeded Capt. James E. Roberts as master of the Panama Pacific liner Pennsylvania, a position he held up until the last sailing of this ship from San Francisco on the 12th of March of this year.

Walter Hays, of Marsh and McLennan-J. B. F. Davis and Son, Limited, will give a University of California Extension course in Marine Insurance at 540 Powell Street, San Francisco, beginning Tuesday, September 20, at 6:30 p.m. The course will deal with the history of marine insurance and of Lloyd's, London; form and development of marine policies covering hull, cargo, and freight; claims; total and constructive total loss; particular average; salvage, and general average. The first meeting of the course will be open without charge to those interested.

Port Authorities

Meeting in Portland, Oregon, for its annual convention, the Pacific Coast Association of Port Authorities this month named **A. H. Abel,** Port Manager and Chief Engineer of the Port of Oakland, president and selected Oakland as the conventional city for 1939.

M. D. McCarl, Port of Oakland Traffic Manager and Assistant Port Manager, was elected secretary and treasurer of the port organization.

Vice Presidents elected were **Glen Arbogast** of Los Angeles and **K. J. Burns** of Vancouver.

Directors who will serve for the coming year are: **J. W. Brennan** of San Diego, **Horace P. Chapman** of Seattle, **W. J. Murphy** of Grays Harbor, **I. M. Stevens** of Long Beach, **K. K. Reid** of New Westminster, **M. H. Gates** of San Francisco, **B. C. Allin** of Stockton, **Hans Mumm Jr.,** of Everett, **F. H. Marvin** of Tacoma and **Frank H. Gowdy** of Longview.

● Pay Envelope

Chairman Emory S. Land of the United States Maritime Commission, employed on a piecework basis, earned six cents as a riveter in the laying of the keel of the new 34,000 ton United States liner being built at Newport News, Virginia, Monday, August 22.

The Chairman, paid at the rate of 68 cents per hour, has received pay envelope number 15,001 from the Newport News Shipbuilding and Dry Dock Company containing a total of six cents. The Chairman's feat was accomplished with the aid of a "holder-on" at fifty-two cents an hour and a heater boy at forty cents an hour. The company's formal piecework statement shows that it took the Chairman and his two assistants one-quarter of an hour to drive a single rivet.

The pay envelope, unopened, will be added to the Chairman's trophies.

On August 17, **Robert W. Horton,** Washington correspondent of The New York World-Telegram, was appointed chief of the section of information of the United States Maritime Commission.

Keel for 34,000 Tonner

W. H. Maybaum, Passenger Traffic Manager, Panama-Pacific Line, received a telegram from his New York headquarters on August 22 reporting the laying of the keel for the largest liner ever to be built in America, at the yards of the Newport News Shipbuilding and Dry Dock Company, at exercises which mark an important step in the construction of the 34,000-ton vessel begun last October for the United States Lines to be successor to the Leviathan.

New Legion Commander

Stanley T. Olafson, Assistant Manager of the Department of Foreign Commerce and Shipping of the Los Angeles Chamber of Commerce and identified with local harbor and shipping matters for the past fifteen years, was elected August 12 Commander of the Merchant Marine Post of the American Legion.

Stanley T. Olafson

The Merchant Marine Post comprises sixty legionnaires connected with businesses revolving around international trade and shipping throughout Los Angeles County. The upbuilding of the American Merchant Marine to a place on the Seven Seas where it properly deserves to be, Olafson declared, is the purpose of the Merchant Marine Post, as is the vital need of fast and modern vessels to serve our national defense purposes as well as to carry the products of our country to all parts of the world.

Installation of officers was held at the Los Angeles Transportation Club rooms at noon Monday, August 22, where a large group of leaders in harbor and shipping matters will participate.

As far as it is known, the Los Angeles group is the first and only American Merchant Marine Post in the United States. Olafson stated that one of the objectives of his administration would be to endeavor to interest shipping men in all of our country's major seaports in organizing similar Posts in order that its aims and purposes may become nationwide.

● Seattle Visitor

To the **Howell Ware** offices in San Francisco recently came XZIT'S Seattle Representative, **Jack Keel** . . . down from the Puget Sound district to learn at first hand the merits of End-O-Soot for galley stoves.

Mr. Keel, (who, by the way, has a good nautical name!) reported a marked improvement in shipping around Seattle and opined that shipbuilding prospects were looming for the district.

Erik Krag, vice president and general manager of Interocean Steamship Corporation, received advice during the month from **Philip C. Ebeling,** President of the United States Junior Chamber of Commerce that he has appointed **Donald Watson** Vice-Chairman of the Marine Committee of the United States Junior Chamber of Commerce. Donald Watson, who is Pacific Coast Traffic Manager for the Weyerhaeuser Line and Pacific Coast Direct Line, intercoastal services for which the Interocean Steamship Corporation are Pacific Coast General Agents, is also the Chairman of the Marine Committee of the California State Junior Chamber of Commerce, and is an active member of the San Francisco Junior Chamber of Commerce.

Names & News

KERMIT ROOSEVELT

Since resigning his post of vice psident and director of the Inter-rtional Mercantile Marine Compny, Kermit Roosevelt has re-tned to the Kerr Steamship Compay in the capacity of a vice presidnt. Headquarters are at the Genell Steamship Corp. in San Fran-cco, agents for some of Kerr's Pacic Coast services.

Mr. Roosevelt first became associted with the steamship business i 1920, when he joined the Kerr Cmpany as vice president. With M. Clegg, president of the line, he fmed other companies and affiliad interests, including the Roosevt Steamship Company, Inc., of wich he ultimately became presidnt. He was active in bringing aout the acquisition of the Roosevt Steamship Company by the Intnational Mercantile Marine.

William Groundwater, *director of tasportation, Union Oil Company, who ently was made a director of the Los eeles Chamber of Commerce and airman of that organization's Harbor, reign Commerce and Shipping Comttee. This committee comprises 165 resentatives of Southern California ns identified with the shipping indus-, exporters, importers, customs house kers and other companies connected business dealings with Los Angeles d Long Beach Harbors.*

n addition to his many other duties, . Groundwater also has been made airman of Union Oil Company's safe-board, supervising accident preventn work throughout the organization.

R. E. BORCHGREVINCK

After his recent return from Stockholm, where he went as special representative for the owners of the Johnson Line, R. E. Borchgrevinck has been made a member of the board and vice president of C. Gardner Johnson, Ltd., at Vancouver, B. C., well known shipping agency in Canada. He was once sub-manager at Los Angeles for the Grace Line.

Acquisition of an interest in the Johnson firm by **Consul General Axel Johnson** of Stockholm brought about a change in personnel of the board of directors. In addition to Mr. Borchgrevinck, the **Hon. H. H. Stevens** and **H. McT. Elliott** were elected to the board along with **James K. Cavers,** who has been a director for a number of years. At the first meeting of the board Mr. Stevens was elected chairman and Mr. Borchgrevinck vice president, representing Consul General Johnson in his diversified fields of activity.

CAPT. T. KENNETH WHITELAW

Announcement was recently made of the appointment of Capt. T. Kenneth Whitelaw as Federal local inspector at Honolulu. He was formerly Assistant Federal Inspector of Hulls at Portland.

Capt. Whitelaw is a grandson of Capt. Thomas P. H. Whitelaw, famed San Francisco salvor and shipowner, and has himself been a master and executive officer of some of the largest Matson liners.

He was third officer on the old Rose City under Capt. Thomas McGinn when that vessel was running regularly between Portland and California, and was executive officer on the Malolo when she made her visit to Portland in 1928 to carry a Chamber of Commerce delegation to Hawaii.

He was also on the Monterey and Lurline, and later served as port captain for the Richmond-San Rafael Ferry Co. at San Francisco.

CAPT. OIVIND MATHISEN

Resigning his post on the bridge of the Norwegian motorship Benjamin Franklin of the Fred Olsen Line, Capt. Oivind Mathisen has entered the importing and exporting business in Oslo. He has spent twenty-one years voyaging the sea, eleven years of which he was a master mariner in the Pacific Coast-European service of the line. **Capt. Karl Reff** succeeds to the vacancy on the bridge.

E. H. GORDON

From Seattle comes word of the appointment of E. H. Gordon as office manager for Lidell & Clarke, Inc. He had been manager of the passenger department, and will retain that post as well.

G. S. Gee, who became assistant to Mr. Gordon in the passenger department last January, will have charge of the freight department. Both have been with the company since 1929, Mr. Gee having been in both the freight and passenger departments in Portland prior to his arrival in Seattle.

Herbert F. Sessions, manager of the Seattle freight department, brought about the changes with his resignation on August 1. He had been with the company since 1922.

CAPT. WILLIAM HENRY MUNTER

After thirty-nine years of service in the Coast Guard, Capt. William H. Munter will take over the post of commander of the Seattle Division on October 1. He has been chairman of the Coast Guard permanent board in Washington, D. C., which is the board that formulates Coast Guard policy.

Capt. Munter was born in Baltimore in 1879, and was appointed a Coast Guard cadet in 1899. His duties have included twenty-four years in Coast Guard ships and fifteen years ashore. He succeeds **Capt. R. W. Dempwolf** in his new post, the latter having been appointed commander of the New York Division and captain of the Port of New York. As Capt. Dempwolf has already taken up his new quarters, **Commander M. J. Ryan** former chief of staff, has been acting commander in Seattle.

Geared Turbine Efficiencies

(Continued from page 31)

amount of time, money and effort has been spent to adapt electric drive to the propulsion of seagoing tonnage, but there is also no question but that, up to the present writing, the electric drive has not been as generally adopted as would have been the case if the efficiency figures given in your article were anywhere near correct. On the contrary, less turbo-electric drive vessels have been built or considered during the last few years than was the case some time ago.

It is equally true that double, or even single, reduction geared turbine drive has been found superior in efficiency, operation and reliability, and certainly more attractive in first cost, than the turbo-electric drive, with the possible exception of special applications where a large auxiliary electric load justifies the running of main generators in port, or for other special conditions.

Windjammers for Training

(Continued from page 33)

ern base of the training program. It is hoped eventually that they may be operated in training cruises between East and West Coasts with bases on both.

Tusitala was formerly owned by James A. Farrell of New York. Mr. Farrell offered her to the commission some time ago. Congress, however, had not authorized the training program at that time and Mr. Farrell subsequently sold her to the Marine Liquidating Corporation. The commission's purchase of her for $10,000 saved her from the scrap pile. She is 261 feet overall with a gross tonnage of 1748 and 1624 net. She was built in Scotland in 1883.

Joseph Conrad is equipped with a diesel motor of 160 horsepower, is 147 feet 6 inches overall, and was built in Copenhagen in 1882. She has a gross tonnage of 212 and 182 net.

Deck Officers' Licenses

The following list shows licenses granted during the month of July to deck officers of the merchant marine at Pacific Coast offices of the Bureau of Marine Inspection and Navigation:

Name and Grade	Class	Condition
SEATTLE		
Philip H. Luther, Chief Mate	OSS, any GT	RG
PORTLAND		
Milton F. Miles, 3d Mate	OSS, any GT	O
SAN PEDRO		
Charles M. Crawford, Master	OSS, any GT	RG
Joseph J. Walter, Master	OSS, any GT	RG
Stanley E. Jorgensen, 2nd Mate	OSS, any GT	RG
John M. Duling, 3d Mate	OSS, any GT	O
JUNEAU		
C. Philip Falconer, 3d Mate	CWSS&MS, 2500 GT	O
SAN FRANCISCO		
Leo E. Delaney, Chief Mate	OSS, any GT	RG
George E. Melanson, Chief Mate	OSS, any GT	RG
Joseph C. Sever, Chief Mate	OSS, any GT	RG
Francis W. Wight, Chief Mate	OSS, any GT	RG
Niels H. Olsen, 2nd Mate	OSS, any GT	O
Albert H. Dengg, 2nd Mate	OSS, any GT	RG
Wilbur Lewis, 2nd Mate	OSS, any GT	RG
Charles W. Caley, 2nd Mate	OSS, any GT	RG
Henry Dengg, 2nd Mate	OSS, any GT	RG
Thomas C. Unsworth, 3d Mate	OSS, any GT	O
Leo J. Leoni, 3d Mate	OSS, any GT	RG
Arthur Baker, 3d Mate	OSS, any GT	O

Abbreviations: GT is gross tonnage; RG is raised grade; O is original license; OSS is ocean steamer; OMS is ocean motorship.

New Stewart Agency

The Landley Company Inc. of New York City announces the appointment of Pillsbury and Curtis, San Francisco, as sole California representatives for the sale of its products. These products include the well known line of Stewart Davits and Life Saving Equipment, which conforms to all the latest regulations of the Bureau of Marine Inspection and Navigation, U. S. Department of Commerce and to the rules of the American Bureau of Shipping.

Stewart mechanical compensating link davits, Stewart release gears, and Stewart chock fittings have been in successful operation on ships of all types and sizes throughout the world for over 25 years. In addition to the standard sizes and forms, special forms and types of screw operated davits and boat cranes are designed and built to suit the special requirements of any customer.

Pillsbury and Curtis, marine engineers and naval architects, are well and favorably known in Pacific maritime circles as a progressive organization competent to give able advice and wise supervision on hull design and construction and on all marine installations.

NEW MERCHANT MARINE POST

National recognition of the activities of Merchant Marine Post No. 420, the American Legion, Los Angeles, for the demand for an adequate American merchant marine, was manifested by the number of congratulatory telegrams received by this organization of World War veterans at their recent installation ceremonies.

Among the many congratulatory messages was one from **R. D. Lapham**, Chairman of the Board of the American-Hawaiian Steamship Co. of San Francisco, lauding the activities of the Post and offering the continued interest and guidance of the shipowners.

Pledged to the cause of a new and adequate American merchant marine and to restore it to its rightful place in world commerce, Merchant Marine Post of Los Angeles is one of the most active units in the American Legion. Sharply restricted in membership to World War veterans in the steamship and allied businesses, much constructive work is being done by the speakers' bureau of the Post. More than 60 talks, including 10 radio broadcasts, on the need for an adequate merchant marine have been made during the past year.

Merchant Marine Post has also been active in the movement to augment the national defense committee of the American Legion, now composed of three subsections—Army, Navy and Aviation—to include a fourth section to be known as Merchant Marine, which unit shall devote its energies to correcting the weakness in this branch of our national defense.

The new officers installed in a colorful ceremony by Past Department of California **Commander Van Hogan** are: **Stanley T. Olafson** of the Foreign Commerce and Shipping Department of the Los Angeles Chamber of Commerce, Commander; **W. J. Sweeney,** traffic manager, Interocean Steamship Co., First Vice Commander; **William Ball,** manager, Pacific American Tankship Assn., Second Vice Commander; **Wayne Thomas,** Frank P. Dow Co., Adjutant; **H. W. Woodruff,** Quaker Line, Chaplain; **Homer Saye,** Matson Line, Finance Officer; **P. N. Carter,** Matson Line, Sergeant-at-arms; **J. J. Burns,** Historian; and **R. O. Vernon, Claire Butler** and **Joe Fay,** Executive Committeemen. **C. S. Booth** of the Matson Line, the retiring Post Commander, automatically reverted to the office of Junior Past Commander.

JAMES GRIFFITHS & SONS IN NEW LOCATION

The Seattle firm of James Griffiths & Sons has moved into new quarters in the Empire Building, after twenty-eight years in the Burke Building. The company first moved into the Burke Building in the '90s, remaining until 1898, when they went to the Bailey Block, now the Railway Exchange Building. In 1910 they returned to the Burke Building for a twenty-eight year occupancy of the same suite.

BARLOW MARINE ELEVATOR
(Patented)

As Built for Ship and Barge Installation

Can be powered by steam, air, gas or electricity. Any capacity or speed desired.

Delivered and Installed anywhere in the U. S. or Canada.

Barlow Marine Elevators are Modern Standard Equipment on Docks and in Freight Boats and Barges.

"They Handle your Freight on the Level".

COLBY STEEL & ENGINEERING COMPANY - Sole Manufacturers

Colby Crane & Engr. Co.
Vancouver, B. C. - 814 Birks Bldg.

HEAD OFFICE:
456 Central Bldg. - Seattle, Wash.

No. 15 Park Row
New York City

Building in American Yards

(Continued from Page 49)

Luckenbach, Frances, Arkansan, Blue Water, Dakotan, Silveryew, El Segundo, Coloradan, Dorothy Wintermote, Pegasus, Bengalen, Brunswick, Silverbeech, Arizonan, Chas. L. Wheeler, Jr., Panaman, Lakland, Dorothy Luckenbach, West Camargo, Tulsagas, Elizabeth, Komoku, Kimoku.

THE PUGET SOUND NAVY YARD

Bremerton, Washington

NEW CONSTRUCTION:

U.S.S. Wilson (Destroyer No. 408); standard displacement, 1500 tons; keel laid March 22, 1937.

U.S.S. Charles F. Hughes (Destroyer No. 428); standard displacement 1600 tons; order placed by Navy Department December 7, 1937.

TODD SEATTLE DRY DOCKS, INC.

Harbor Island
Seattle, Wash.

DRYDOCK AND ROUTINE REPAIRS:

M.S. Kalakala, Capac, Nebraskan, M.V. General, Susan V. Luckenbach, Dorothy Luckenbach, Point Lobos, Tug New England, Lillian Luckenbach, M.V. Alaska Standard.

WESTERN BOAT BUILDING CO., INC.

2505 East 11th Street
Tacoma, Wash.

NEW CONSTRUCTION:

Hull No. 131, purse seine fishing boat, 78'x20'x9'; 200 H.P. Atlas engine; launching date May 1, 1938.

Hull No. 132, 50' pick-up fishing boat for New England Fish Company. Keel laid March 12, 1938.

Atlantic, Lakes, Rivers

BATH IRON WORKS

Bath, Maine

NEW CONSTRUCTION: **Hulls Nos. 161, 162 and 163; DD394 Sampson, DD395 Davis and DD396 Jouett; three 1850-ton destroyers for U.S. Navy;** date of contract September 19, 1935. Keels laid, No. 161, April 8, 1936; No. 162, July 28, 1936; No. 163, March 26, 1936. Launching dates, No. 161 April 16, 1938; No. 162 July 30, 1938; **No. 163 September 24, 1938; estimated delivery dates August,** October and December, 1938, respectively.

Hulls Nos. 170-171, DD409, Sims, and DD410, Hughes, two 1500-ton destroyers for U. S. Navy; contract date October 12, 1936; keels laid July 15 and September 15, 1937, respectively; launching dates, indefinite; delivery dates April, 1939, and June, 1939, respectively.

Hulls Nos. 177 and 178, DD423 and DD424, two 1620-ton destroyers for U. S. Navy. Contract date September 30, 1937; delivery dates April and June, 1940, respectively.

BETHLEHEM SHIPBUILDING CORPORATION, LTD.

Fore River Plant,
Quincy, Mass.

NEW CONSTRUCTION:

CV7, Wasp, Airplane Carrier for U. S. Government; keel laid April 1, 1936; estimated launching date December, 1938.

Hulls Nos. 1467, 1468, 1469, three passenger and freight steamers for Panama Railroad S.S. Co.; 486 feet x 64 feet x 38 feet 6 inches; 16½ knot speed. Keels laid, Nos. 1467 and 1468, October 25, 1937; No. 1469, November 15, 1937; **estimated launching dates September 24, 1938,** November, 1938, and January, 1939.

Hulls Nos. 1470 and 1471, two 1500-ton destroyers for U. S. Government; delivery dates March, 1940, and May, 1940.

Hulls Nos. 1472 and 1473, two diesel powered trawlers 147'0" overall, 128'9" perps., 27'0" beam, 14'4" depth; estimated delivery dates November 15 and December 15, 1938.

BETHLEHEM SHIPBUILDING CORPORATION, LTD.

Sparrows Point Plant
Sparrows Point, Md.

NEW CONSTRUCTION:

Four 13,000 deadweight ton steam turbine driven tankers for Standard Oil Co. of N. J.; length 442', beam 64', depth 34' 10", gross tonnage 7,600, speed 12 knots. Esso Baton Rouge launched November 13, 1937; R. W. Gallagher launched January 22, 1938; Esso Baltimore launched June 4, 1938; Esso Charleston launched July 23, 1938.

One tanker for Texas Co.; about 13,000 deadweight tons; steam turbine.

Hull No. 4334; one 13,000 dwt. oil tanker for Union Oil Co. of Calif. Contract signed March, 1938.

Hulls Nos. 4329, 4330, 4331; three 16,300 dwt. ton tankers for Standard Oil Co. of N. J.; 18 knots speed. Contract signed January 3, 1938.

Hulls Nos. 4332 and 4333; two 16,000 dwt. tankers for Socony Vacuum Oil Co. Contract signed February, 1938.

BETHLEHEM SHIPBUILDING CORPORATION, LTD.

Staten Island Works
Staten Island, N. Y.

NEW CONSTRUCTION:

Hull No. 856, fireboat for City of New York. Length O.A. 134'0", breadth 32'0", depth 13'3". Keel laid April 19, 1938; **estimated launching date August 29, 1938; estimated delivery date September 15, 1938.**

Hulls Nos. 8001, 8002, and 8003, three U. S. Navy fleet tugs. No. 8001, keel laying date January 24, 1939; launching date July 11, 1939; delivery date January 25, 1940. No. 8002, keel laying date February 7, 1939; launching date September 5, 1939; delivery date March 25, 1940. No. 8003, keel laying date February 21, 1939; launching date November 7, 1939; delivery date May 25, 1940.

BOSTON NAVY YARD

Boston, Mass.

NEW CONSTRUCTION:

DD402, Mayrant, and DD403, Trippe, two light destroyers for United States Navy; LBP 334', beam 35'6", depth 19'8"; kee laid April 15, 1937; launched May 14, 193 estimated delivery dates October, 1939, an November, 1939, respectively.

DD415, O'Brien, and DD416, Walk two destroyers; LBP 341', beam 36', dept 19'8"; keels laid May 31, 1938; deliver date 1940.

DD425, Madison, and DD426, Lansdal two destroyers; 341'0" x 36'0" x 19'8". Kee laying date December 1, 1938; launchin date November 1, 1939; delivery date 194

One harbor tug for U. S. Navy; 98'0 LBP x 24'0" x 13'6"; keel laid March 28 1938; launched June 10, 1938; **completio date September 15, 1938.**

DD433 and DD434, two destroyers, con tract awarded July 23, 1938.

BROOKLYN NAVY YARD

Brooklyn, N. Y.

NEW CONSTRUCTION:

CL 48, **Honolulu, light cruiser;** L.B. 600', beam 61'8", standard displacemen 10,000; geared turbine engines; express typ boilers; keel laid September 10, 1935 launched August 26, 1938; **delivered Augus 1, 1938.**

CL 50, **Helena, light cruiser;** L.B.P. 600', beam 61'7¾", standard displacement 10,000 geared turbine engines; express type boilers keel laid December 9, 1936; **estimate launching date August 27, 1938;** estimate delivery January 2, 1940.

BB 55, **North Carolina, battleship;** L.BP 714' 0", beam to outside armor 108' 0", std. displ. 35,000 tons; geared turbine en gines; express type boilers. Keel laid Octo ber 27, 1937; estimated launching date Ma 1, 1940; contract delivery September 1 1941; estimated delivery date October 15 1941.

CHARLESTON, S. C., NAVY YARD

Charleston, S. C.

NEW CONSTRUCTION:

Order placed for **one harbor tug;** LO 124' 9", length between perpendiculars 117 breadth molded 28', depth molded 16'; kee laid August 2, 1937; launched March 7 1938.

Order placed for **one harbor tug;** LO 110' 3", LBP 98' 0", breadth 24' 0", dept at side amidships 13' 6". No dates set.

Order placed for one **harbor tug;** 65 fe long.

DEFOE BOAT & MOTOR WORKS

Bay City, Mich.

NEW CONSTRUCTION:

Hulls Nos. 72 and 73; two diesel electri harbor cutters for Coast Guard; 110' x 26' 6" powered by 1000 S.H.P. General Motor engines; steel construction. Delivery dat April, 1939.

THE DRAVO CORPORATION

Engineering Works Division
Pittsburgh, Pa., and Wilmington, Del.

NEW CONSTRUCTION:

Hull No. 1452; one welded steel o **barge** 195' x 35' x 9'6", for stock 48 gross tons.

Hulls Nos. 1462-1465; four welded carg **box barges** 100' x 26' x 6'6", for stock; 66 gross tons.

Hulls Nos. 1466-1475; ten welded W-

FEDERAL MARINE PAINTS

"With the quality of Endurance!"

These protective paints:

Anti-Fouling
Anti-Corrosive
Boottopping
Cabin Paints
Deck Paints
Deck House Paints
Hold Paints
Red Lead (Mixed)
Smoke Stack Paints
Topside Paints

For:

Tankers
Freighters
Passenger Liners
Steam Schooners
Ferry Boats
Pleasure Craft
Work Boats
Government Vessels

FEDERAL WILL HELP YOU SAVE ON YOUR PAINTING COSTS

The Federal Composition & Paint Co., Inc.

33 Rector Street, New York, N. Y.

ON THE PACIFIC COAST:

SEATTLE, WASHINGTON
A. T. B. Shiels
108 West Lee Street

PORTLAND OREGON
Chalmers Shipping Co.
Board of Trade Building

SAN FRANCISCO, CALIF.
Pillsbury & Curtis
100 Bush St. KEarny 3302-3

SAN PEDRO, CALIF.
Robert S. Gardner
P. O. Box 231

Agents and Stocks in all the Principal Ports

FORGINGS . . .

OF ALL DESCRIPTIONS

for the

MARINE and ALLIED INDUSTRIES

AMERICAN FORGE CO.

Established 1888

750 POTTER STREET BERKELEY, CALIFORNIA

---

227 Vessels today

have eliminated mechanical boiler cleaning expense because their owners realize the value of the HALL SYSTEM OF BOILER WATER CONDITIONING.

The Hall Laboratories has earned the confidence and respect of every shipowner it is serving.

HAGAN CORPORATION

BOWMAN BLDG. PITTSBURGH, PA.

coal barges 175′ x 26″ x 10′8″, for stock, 4720 gross tons.

Hull No. 1476; one welded steel coal barge 126′ x 34′ x 17′ for M. & J. Tracy, Inc.; 673 gross tons.

Hulls Nos. 1477-1479; three welded hopper type steel coal barges 195′ x 36′ x 11′, for Marquette Cement Mfg. Co.; 2160 gross tons.

ELECTRIC BOAT CORP.
Groton, Conn.

NEW CONSTRUCTION:

Hull No. 29, Sargo (SS188); standard displacement 1450 tons; keel laid May 12, 1937; launching date June 6, 1938; delivery date February, 1939.

Hull No. 30, Saury (SS189); standard displacement 1450 tons; keel laid June 28, 1937; **launching date August 20, 1938;** delivery date April, 1939.

Hull No. 31, Spearfish (SS190); standard displacement 1450 tons; keel laying date September 9, 1937, launching date October 29, 1938; delivery date June, 1939.

Hull No. 33, Seadragon (SS194); 1450 tons; keel laying date April 18, 1938; delivery date December, 1939.

Hull No. 34, Sealion (SS195); 1450 tons; keel laying date June 20, 1938; delivery date February, 1940.

Hull No. 35, Tambor (SS198); standard displacement 1475 tons; keel laying date January 16, 1939; delivery date January, 1941.

Hull No. 36, Tautog (SS199); standard displacement 1475 tons; keel laying date March 15, 1939; delivery date March, 1941.

Hull No. 37, Thresher (SS200); standard displacement 1475 tons; keel laying date May 15, 1939; delivery date May, 1941.

THE FEDERAL SHIPBUILDING AND DRYDOCK COMPANY
Kearny, N. J.

NEW CONSTRUCTION:

Three destroyers, DD397 Benham, DD398 Ellet and DD399 Lang, 1500 dis. tons; keels laid September 1, 1936, December 3, 1936, and April 5, 1937, respectively; **launching dates** April 16, June 11 and **August 27, 1938,** respectively.

Two destroyers, DD411 Anderson and DD412 Hammann; keels laid November 15, 1937, and January 17, 1938, respectively.

Hulls Nos. 149, Pan-New York, and 150, two 12,900-ton tankers for Pan American Petroleum and Transport Co.; 440′ B.P. x 66′6″ x 34′6″, 450′ O.A.; Isherwood Arcform design of hull form and longitudinal hull framing. Keels laid November 15, 1937, and January 10, 1938, respectively; launching dates May 14 and July 22, 1938; **No. 149 delivered July 8, 1938;** No. 150 estimated completion date October, 1938.

Hulls Nos. 151, 152 and 153, three tankers for Standard Oil Co. of New Jersey; keels laid, No. 151, July 1, 1938; No. 152, July 15, 1938.

Hulls Nos. 154-159, six C-2 cargo vessels for U. S. Maritime Commission.

Hulls Nos. 160 and 161, two torpedo boat destroyers for the United States Navy.

INGALLS IRON WORKS CO.
Birmingham, Ala.

NEW CONSTRUCTION:

One 15-ton derrick boat hull for U.S. E.D.; launched June 1, 1938.

Two diesel dredge tenders 63′ x 15′6″ x 6′3″ for U. S. Engineer Office, Memphis, Tenn. **Launching date about September 10, 1938.**

Ten hopper type cargo barges 280′ x 48′ x 11′ for Inland Waterways Corp. **Launching dates June to October, 1938.**

JAKOBSON & PETERSON, INC.
Brooklyn, N. Y.

NEW CONSTRUCTION:

Hull No. 274, 84-foot all welded steel tug. Launched June 14, 1938; **delivered August 31, 1938.**

Hull No. 276, 86-foot all welded steel tug. Launching date August 31, 1938; delivery date October 1, 1938.

LEVINGSTON SHIPBUILDING CO
Orange, Texas

NEW CONSTRUCTION:

Two all welded anchor barges 55′ x 20′ x5′, equipped with 2-drum gasoline hoist, for U. S. Engineer Office, Galveston, Texas.

MANITOWOC SHIP BUILDING CO.
Manitowoc, Wis.

NEW CONSTRUCTION:

One tanker for Socony-Vacuum Oil Company, Inc., New York: 290′ x 49′6″ x 20′6″; 23,600 barrels capacity: 1500 H.P. twin screw diesel. Launched June 9, 1938; **delivered August 6, 1938.**

THE MARYLAND DRYDOCK CO.
A Subsidiary of Koppers Company,
Baltimore, Maryland

NEW CONSTRUCTION:

Hull No. 194, single screw steel derrick lighter for U. S. Engineer Office, N. Y. District. LOA 115′ 9⅜″ LBP 110′, beam overall 30′ 8¾″, beam molded 30′, depth molded 11′ 9″, frame spacing throughout 21″, load displacement 438 tons, mean load draft molded 9′ 2½″. **Estimated keel laying date September, 1938;** estimated launching date December, 1938.

DRYDOCK AND ROUTINE REPAIRS: **Lightship No. 94.**

THE NEW YORK SHIPBUILDING CORPORATION
Camden, N. J.

NEW CONSTRUCTION:

Hull No. 416, Phoenix (CL46), light cruiser; 10,000 tons; for U. S. Navy Department: keel laid 1937: launched March 12, 1938.

One destroyer tender for U. S. Navy; order placed December 27, 1937.

One seaplane tender for U. S. Navy; order placed December 27, 1937.

NEWPORT NEWS SHIPBUILDING DRYDOCK CO.
90 Broad Street, New York

NEW CONSTRUCTION:

H361, light cruiser, CL47, Boise, keel l April 1, 1935; launched December 3, 19 **delivery date August, 1938.**

H362, light cruiser, CL49, St. Louis, k laid December 10, 1936; launched April 1 1938; delivery date April, 1939.

Hulls Nos. 363-364, two destroyers, N 413, Mustin, and 414, Russell; keels la December, 1937; delivery dates June a August, 1939.

Hull No. 369, twin screw mail, passe ger and cargo liner for United States Lin Co.; length 723′, beam 92′, depth 45′. **K laying date August 22, 1938.**

Hulls Nos. 370, 371 and 372, three tankers for Standard Oil Company of N Jersey: gross tonnage about 11,500 to L.B.P. 525′, breadth molded 75′, dep molded 39′.

Hulls Nos. 373, 374, 375 and 376, fo single screw cargo vessels for United Stat Maritime Commission: turbine propulsio gross tonnage about 9000 tons: length 43 breadth 63′, depth 40′6″.

THE PUSEY & JONES CORP.
Wilmington, Del.

NEW CONSTRUCTION:

Hull No. 1069, Cavalier, single screw, ste freight steamer for the Philadelphia and No folk Steamship Co., Philadelphia, Pa. L.O. 292′, L.B.P. 280′, beam 48′6″, depth 32′3 draft 18′; geared turbine drive 4000 S.H. 2 water tube boilers. Launched April 1 1938: **delivered August 5, 1938.**

Hull No. 1070, one steel hopper dredg Chester Harding; 2,500 cubic yard capacit length overall 308′2″, length B.P. 300′0 breadth molded 56′0″, depth molded 29′0 Contract date February 14, 1938; keel la May 15, 1938; delivery May, 1939.

SUN SHIPBUILDING AND DRY DOC COMPANY
Chester, Pa.

NEW CONSTRUCTION:

Hull No. 169, one oil tanker (steam 520′ x 70′ x 40′: for Atlantic Refining Co 18,500 tons: keel laying date November 3 1937: **launching date July 9, 1938; delive date August 20, 1938.**

Hulls No. 172, 173 and 174, three tank ers for Standard Oil Co. of New Jerse steam turbine: 525′ x 75′ x 39′: 16,300 dw Keel laying dates April 18, May 31 an July 14, 1938: delivery dates February April 11 and May 15, 1939.

Hulls Nos. 175-180, six single screw dies cargo vessels, C-2 design, for U. S. Maritim Commission; equipped with Sun-Doxford e gines. Delivery dates July 4, 1939: Septe ber 2, 1939; November 1, 1939: Decemb 31, 1939: March 1, 1940, and May 1, 194

Hull No. 181, single screw steam turb electric drive tanker for Atlantic Refinin Co.; 521′ x 70′ x 40′. Delivery date Marc 1, 1940.

ACIFIC
ARINE
EVIEW

TOBER
9 3 8

he Job!

AN - HAWAIIAN
u on the job for
ars. Carefully and alertly it has
d its job. A 39-ship fleet to serve you.

Fine Linen

TELLS ITS *OWN* QUALITY STOR

If you were a linen buyer you would have little difficulty in telling that *this* linen was of the finest quality, for it is instantly apparent in many ways.

But the buyer of rope has a more difficult problem. *Not* so apparent is the quality of the fibre, the care and accuracy of construction and, more important, the service and dependability it offers the user.

Marine Rope buyers cannot afford to take chances. They must depend upon brand names that have *proven* their uniform dependability.

That is why the Tubbs trademarks on rope have become the standard of the Pacific. Operators and crew alike know that they stand for the maximum in safety and performance. For *assured* quality and long-run economy, specify Tubbs Marine Rope—

TUBBS ROPE

SUPERCORE - - EXTRA SUPERIOR MANI

TUBBS *Cordage Company*

200 Bush Street, San Francisco
Mills in San Francisco

ACIFIC
ARINE
EVIEW

TOBER 1938

Official Organ

acific American
eamship Association

ipowners Association
the Pacific Coast

Our Frontispiece

We present this month oppo-
te the editorial page a repro-
ction of a painting by famous
merican artist Charles R.
tterson of New York, show-
g the American ship W. R.
race under full sail.

W. R. Grace was built in the
eventies" for the Grace serv-
es from New York to San
ancisco and to the Pacific
ast of South America.

TABLE OF CONTENTS

Editorial Comment 21

Bethlehem's Union Plant Reconditioned 22

Two Interesting Diesel Electric Tugs 28

The New Union Oil Tanker 32

Your Problems Answered 36
By "The Chief."

Komoku, a page of illustrations 39

For the Deck Officers 40

The American Republics Line 43

Proposed New Steamers for Delta Line 44
By N. O. Pedrick.

Victor-Kimball-Krogh Pumps in Marine Service 46

Safety Observance in Terminal Operation 48
By Byron O. Pickard.

Glass Textiles Aboard Ship 50

On the Ways:
- Latest News from American Shipyards 52
- Building in American Yards 64

LISHED AT 500 SANSOME STREET . . . . SAN FRANCISCO

as second class matter June 20, 1913, at the post office, San Francisco, under the Act of March 3, 1879. Published on the 1st of each Advertising and editorial forms close on the 15th. Subscription price, one year: Domestic, $1.50; foreign, $2.50; two years: Domestic, oreign, $4.00; three years: Domestic, $3.00; foreign, $5.50; single copies, 25c. Chas. F. A. Mann, Northwest Representative, 1110 ound Bank Bldg., Tacoma, Washington. New York Office, Suite 404-405-406, Two Hundred Broadway, Telephone COrdlandt 7-3579.

York City copies of Pacific Marine Review can be purchased at the news stands of I. Goldberg, 42 Broadway; Harry Nash, 17 Battery hilip Mandara, Greenwich Street and Battery Place. In Washington, D. C., at the news stand of the Carlton Hotel, 16th and K Streets.

S. Hines	B. N. DeRochie	Alexander J. Dickie	Paul Faulkner	F. Dryden Moore
t and Publisher	Assistant Publisher	Editor	Advertising Manager	Assistant Editor

PACIFIC MARINE REVIEW

OLUME XXXV OCTOBER, 1938 NUMBER 10

National Defense Versus National Defense

Let's Make It Economic

By E. E. JOHNSON

In recent months we have heard and seen much in speech and print of American ships for the military defense of the United States and as naval auxiliaries. A great to-do has been made of the fact that the United States Navy has its fleet in the Pacific; that there is a great lack of repair facilities due to the scarcity of experienced shipbuilders, technicians, and skilled labor by reason of the almost complete stoppage of shipbuilding on the Pacific Coast since the World War; and that the Pacific is almost stripped of suitable shipping under the American flag, which would create an unpleasant feature in the case of any national emergency.

These are true indictments and need early correction. As regards shipbuilding plants and efficient staffs, the nucleus is here and ready; but to develop these facilities requires more than a contract for one or two ships. Shipyards must be assured of a steady demand for ships for years to come. If we are to stay on the seas, as so clearly set forth in all Congressional sea acts since 1916, we must develop a long range program of steady progress with new ships and replacements within a reasonable period. This may require the opportunity for owners to freely sell their vessels in world markets, so as to displace older vessels with more modern tonnage.

As regards ships. The old American tendency to disparge what we have has had full sway. Much has been printed to show how obsolete are the vessels built during and since the World War. To some of this criticism we agree. To a great deal of it we disagree. As regards fuel consumption, many of these vessels are white elephants, as compared with modern engineering practices. Some vessels have been permitted to deteriorate to a greater extent than their age and proper upkeep should show. But, generally, the ships are as good and often better than ships of corresponding age of other fleets. On the other hand, we have a tendency to pass acts requiring improvements that are costly and to make these mandatory upon old ships, where construction features provide elements that make these improvements difficult to say the least, in fact, some of these are almost prohibitive in cost, considering the age of the vessel. And here the shipowner is between the devil and the deep blue sea. If he objects to safety-at-sea measures proposed in Congress he is immediately branded as a seeker of profits at the expense of human life. So we pass the acts, apply them to old ships, and let the shipowner scratch. And in so doing we tell the gleeful maritime world how obsolete and terrible our ships are, when, as a matter of fact, our ships are fully on par with any like ships, and often better, because of our strictly legal conditions.

Our Pacific Coast has felt the stripping hand more forcibly than other localities.

Intercoastally the great passenger liners have been withdrawn and a few replace-

(Page 31, Please)

Bethlehem Reconditions Potrero Works

New power house and stack.

Known to every shop and ship man on the Pacific Coast as the old "Union Iron Works," the ship repair and shipbuilding plant now designated as the Potrero Works of the Union Plant of the Bethlehem Shipbuilding Corporation, Ltd., will always maintain its place in history as the first established and most celebrated steel shipbuilding yard on the Pacific Coast of North America. The fact that this plant has recently been rejuvenated and transformed into a modern shipbuilding establishment should therefore be of great interest to readers of Pacific Marine Review. We present the details of this reconditioning as told the editor by the executives in charge of the job and as caught by the camera.

In planning the changes and betterments for this plant the following main objectives were kept prominently in mind:

(a) Prompt and low cost transfer of material from rail or ship to storage, from storage to shop, from shop to ways;

(b) Provision of electric, pneumatic, hydraulic power outlets in ample quantity and in convenient location to promote efficient use of portable machinery;

(c) Simplicity of layout and permanence in quality to cut down maintenance costs;

(d) Provision of adequate space for welding in sub-assembly fabrication;

(e) The establishment of modern Bethlehem standards in safe working conditions for all employees;

(f) The provision of modern sanitary conveniences for all employees;

(g) Adequate storage facilities with provision for keeping all materials and tools in proper working condition at all times; and

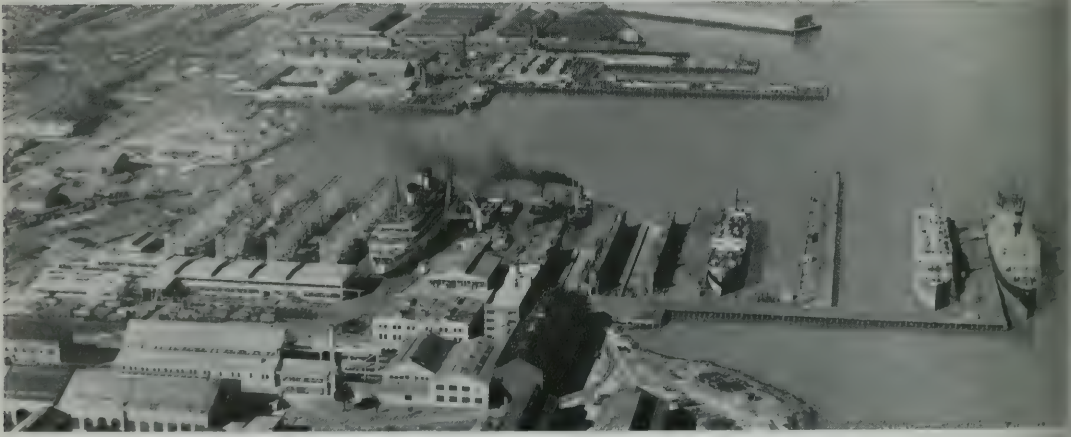
(h) Adequate parking facilities for employees' automobiles.

The reconstruction and modernization plan commenced in 1936 and comprised the following units:

(1) Construction of a new forge and blacksmith shop;

(2) Construction of a new steam power house and auxiliary compressor plant;

(3) Construction of a new painters' and riggers' building;



Bird's-eye view of the Potrero Works, showing shops, building ways, floating docks and outfitting wharves.

of *Union Plant*

(4) Construction of new storage eds for lumber, tubes, acetylene, c.;

(5) Construction of modern sani- ry facilities for workmen;

(6) Construction of a concrete ench system for yard piping;

(7) Construction of a new brass undry furnace room;

(8) Modernization of planing mill, ttern and joiner shops, with re- acement of a majority of tools;

(9) Modernization of machine op, with replacement of many ols;

(10) Modernization of plate shop, ith mechanical gas cutting equip- ent and other tools;

(11) Change of plant fuel system om oil to natural gas;

(12) Rewiring of entire plant elec- ic system to conform to municipal, ate and national fire and safety rules;

(13) Repaving of yard and im- ovement of track system;

(14) Installation of new constant tential welding equipment to take re of 90 arcs.

These in brief skeletonized out- es are the operations that have ansformed the Potrero Works of e Union Plant.

Every old building that was to be tained in the complete scheme was oroughly renovated inside and out, sash reglazed where necessary, d the inside walls and ceilings inted white.

Many new tools were installed d older tools retained were re- ranged to make them more effec- e in the new shop plan.

The result is a modern plant ar- nged, equipped and geared for odern shipbuilding and ship repair erations.

Over $1,500,000 was expended on ese betterments during the past o years.

New checking house.

Let's consider a little the a. b. c's of this job.

Material Handling

All railroad track curves were carefully lined up and the curvatures reduced to a minimum inside radius of 120 feet. All dock and yard surfaces were graded level and surfaced with a bituminous macadam pavement. For surface movement of materials, a fleet of gasoline drive tractors is used with special trailers built to Bethlehem design and specifications. The axles of these trailers run in roller bearings and the wheels are fitted with puncture proof pneumatic tires. Each trailer is designed for a load of 4000 pounds, will take 5000 pounds safely, and so loaded can easily be pushed along a level pavement by one man.

As will be noted in the general arrangement plan herewith, the structures in the shipyard are so located that the material in process of fabrication moves through the various shops in natural sequence and as close to straight line movement as is practicable. This is true of the line from steel plate and shape storage racks through the plate shop, and sub-assembly spaces to the building ways. It is also true of movement of material and equipment through either the machine shop, the forge shop, the mill-pattern-joiner shop, or the pipe and copper shop to either the building ways or the outfitting docks.

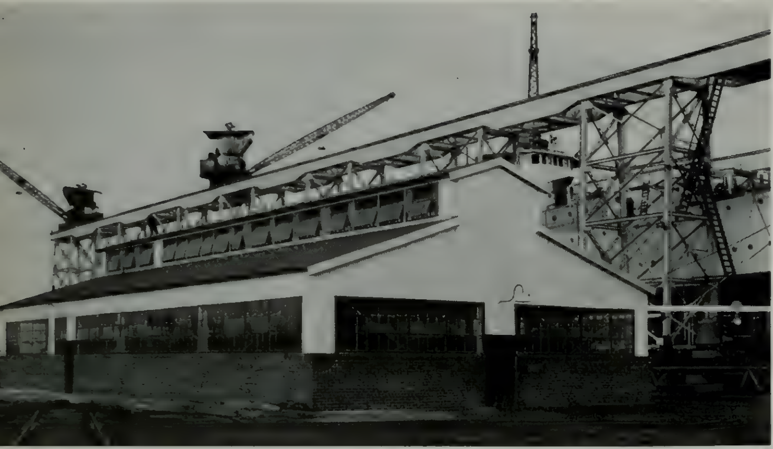
Each of the three shipbuilding ways is served by two 15-ton capacity overhead cranes traveling on elevated runways. By an ingenious use of 3 equalizer girders four cranes can be hitched together and will handle 40 tons to any part of the 3 ways. The elevated runways carrying the cranes have a length of 420 feet and a width of 86 feet between centers of runways. Vessels 500 feet overall length and 65 foot beam could be built here. For heavier weights there is a 100-ton sheer legs at the outfitting basin.

Power Distribution

In order to make this yard independent a complete steam power plant has been installed in a separate power house. Two water tube boilers are used, each having a rated capacity of 350 horsepower and each being capable of continuous operation under a load of 700 horsepower. These boilers are equipped with Bethlehem-Dahl combination gas and oil burners fitted with automatic firing control. Normally the burners use natural gas. If for any reason natural gas supply fails, the burners can be changed over to oil fuel in a few minutes.

Three air compressors with a combined capacity of 1700 cubic feet of free air per minute are installed in this new power house.

In order to facilitate connection, inspection, maintenance, and repairs, a pipe trench of reinforced concrete was installed in a loop encircling the entire yard. The various pipe lines, including fresh and salt water, hydraulic service, pneumatic service, natural gas and fuel oil services, are carried on hangers on each side of



New wash and locker room in shipyard.

this trench. This trench gives ample room for a man to pass between the pipes. It is covered at the top with checkered iron plates. Passing under railroad tracks it connects through 42-inch diameter corrugated steel culverts.

All of the electric wiring was completely overhauled and renewed or altered to comply with the modern fire and safety rules of the city, state and nation. In this rewiring particular attention was given to the arrangement and location of all motor controls and of welding and portable-tool power outlets.

Electric power is distributed through panels of the large 440 volt sizes with several features of special design for this installation.

Artificial lighting for the entire plant was renewed. Lighting fixtures are all of the Holophane Prismatic Refractor type. These fixtures are installed in sufficient quantity to give practical daylight illumination over every part of the floors in al shops with elimination of all objectionable shadows. The effect of this illumination is greatly enhanced by the use of white paint on all interior surfaces in new and old shops.

Shop Construction

All of the new shop construction is of steel frame with steel sash and doors. Practically the entire wall area of the new buildings is covered with glazed sash, except for a five-foot brick wall at the bottom, and corrugated sheets above windows. The roofs are covered with corrugated sheets.

Ample overhead crane capacity is installed and in each shop the storage of raw materials is adjacent to the shop and arranged so that materials may be handled into the shop and to each tool by the system of overhead cranes.

Notable in this respect is the large new forge shop. Here the overhead cranes run right out over the bloom storage yard and deliver the blooms direct to the furnaces.

All of the new shops, as will be noted from the illustrations, give an impression of great spaciousness. Every tool has ample room around it for swinging large work. In the forge shop space is reserved for the

Typical interior of one of the new washrooms.

re installation of a 1000-ton hy- ulic press.

ll the new shops are immaculate white painted interiors. This es for more efficient work, safer king conditions, and ease of in- tion and routine upkeep.

Welding Provisions

ecognition of the trend toward ling in ship hull assembly is evi- in the rearrangement of the on Plant. Regulations now re- e that all welders employed on er naval or merchant marine struction shall be certified by the y Department or the Depart- t of Commerce. In order to cre- supply of such qualified weld- a welding school was started at Potrero Works several years

he large welding slab of heavy channel construction is located the west side of the building with ample room for sub-as- bly and is served by the elevated ways alongside the ways. r new 1000 ampere 65 volt mul- operator welding generator sets installed, making a total of such units. The entire ship- ling way superstructure was d for conveniently located out- where portable resistor reactor houses could be plugged in to serve welders on the job. Seventy-five of these portable resistor reactor houses are kept in good working condition. Each generator set will supply power to 15 welders.

While looking over the yard we had an opportunity to inspect the hull of one of the new torpedo boat destroyers which was lying at the outfitting dock practically ready for delivery. We can truthfully say that we have never seen better workmanship.

Safe Working Conditions

"Safety first" is a practical working slogan in all Bethlehem institutions. In this modernization job safety in working conditions is secured largely through the application of common sense. We have already mentioned the lighting—the white interiors—the general drastic clean up—all of which are fundamentals in any planning for safe working conditions.

Another fundamental already mentioned is ample space around tools. In several of the shops and wherever the nature of the floor makes it practicable the space around each tool is zoned by a yellow border and any employee who leaves any object on the floor within that border is liable to severe discipline.

Every tool is equipped with the best safety guards and devices for control.

A safety committee of the employees is busy at accident prevention work. A small hospital is maintained at the plant. Every accident must be immediately reported to the hospital.

Comforts for Workmen

The most spectacular betterment in this program of progress is the modern sanitary provision for the comfort of the employees. For every man employed there is provided a

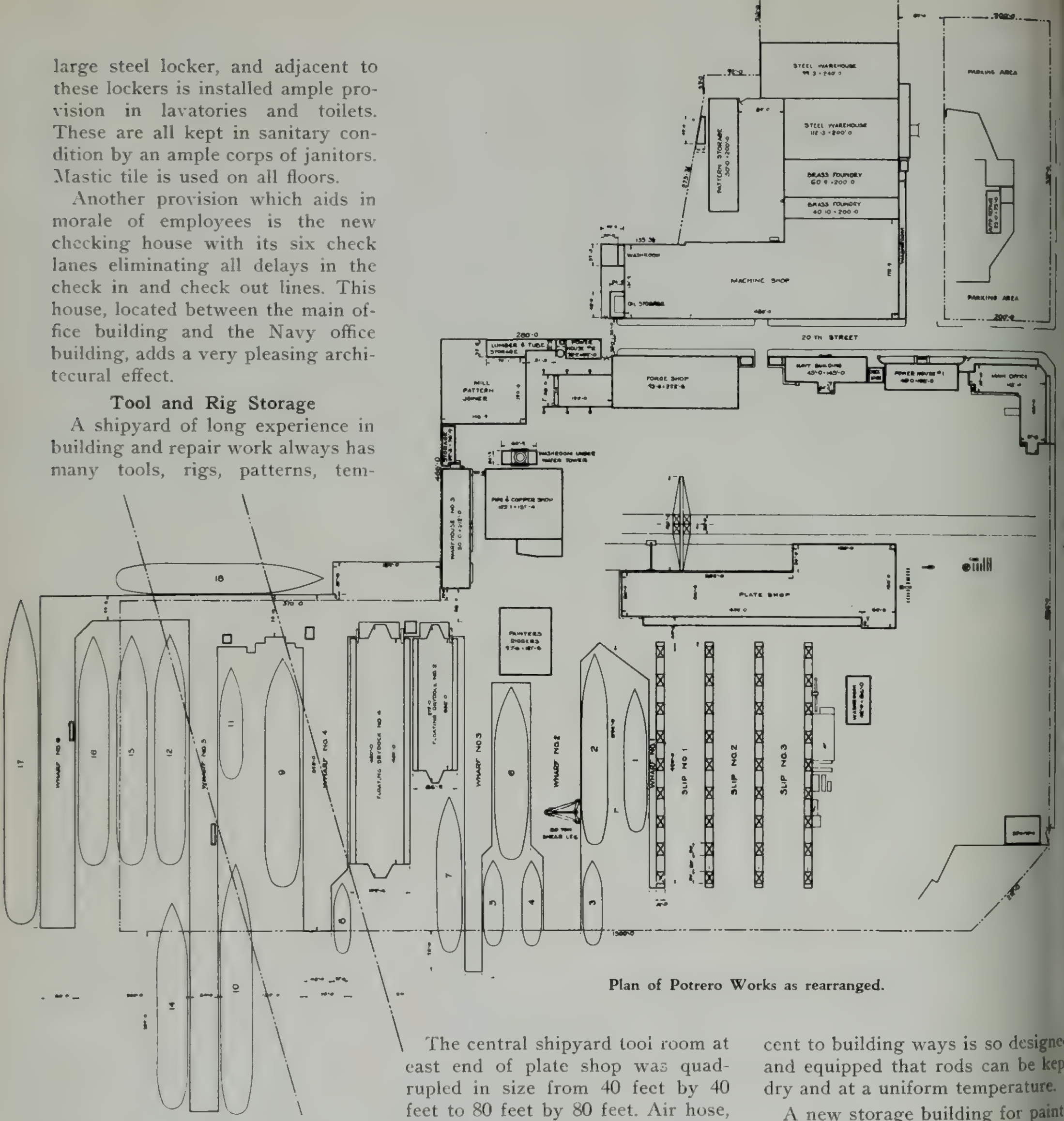
At left on facing page: A close-up bird's-eye view of plate shop, plate storage and building ways. Above: Part of the interior of plate shop, featuring bending slab and furnaces.

large steel locker, and adjacent to these lockers is installed ample provision in lavatories and toilets. These are all kept in sanitary condition by an ample corps of janitors. Mastic tile is used on all floors.

Another provision which aids in morale of employees is the new checking house with its six check lanes eliminating all delays in the check in and check out lines. This house, located between the main office building and the Navy office building, adds a very pleasing architecural effect.

Tool and Rig Storage

A shipyard of long experience in building and repair work always has many tools, rigs, patterns, templates, and jigs which are invaluable when wanted for an emergency, but at the time wanted and in between times are apt to be very much of a nuisance unless provided with adequate stowage space and proper care. With this fact in mind existing tool rooms were enlarged and/or moved to new locations, and new tool rooms and storage space provided so that all special tools could be kept in working condition and easily get-at-able for emergency jobs.



Plan of Potrero Works as rearranged.

The central shipyard tool room at east end of plate shop was quadrupled in size from 40 feet by 40 feet to 80 feet by 80 feet. Air hose, pneumatic tools, temporary lighting fixtures, and cords are all issued from this tool room. A system and equipment have been installed which insure that all material, tools and equipment issued from this room shall be in first class working condition.

Stowage racks for plates, angles and shapes are adjacent to plate shop and completely covered by crane service.

A new storage room and issuing room for welding rod located adjacent to building ways is so designed and equipped that rods can be kept dry and at a uniform temperature.

A new storage building for paint and painters' rigging and for all riggers, plate hangers, scaffold erectors, and other repair equipment was located close to the drydocks and is supplemented by a small paint house between the docks for cleaning and stowage of brushes and paint for immediate use. In the main paint house are adequate washing and toilet facilities for painters.

Storage for large size pipe is in open racks at the west side of pipe shop and for small sizes in warehouse on east side of pipe shop.

New Tools for Old

is interesting to observe the trds in retooling of the various shps due to changes in shipbuilding mhods, improvements in tools, and mlern developments in shop operatis. In any shipyard the most imtant shop unit is the plate shop, wre the plates and shapes that me up the structural work of a h are formed to templates lifted fn hull lines as laid down full size o the scrive board.

t the Potrero Works the plate sh follows the usual practice as to lotion and arrangement, lying ass the inshore end of the building sls and being of two story contion with the mold loft and scrive bord on the upper floor.

the trend toward welded in pe of riveted joints in ships' hulls, puching machines are becoming le important and the plate planers me important as plate shop tools.

ydraulic power is used considera in this shop, and the hydraulic pps and accumulator were therefo moved into the shop so as to h the advantage of short high psure lines. All furnaces in this sh were changed over to natural g firing.

otable among the new tools insted is the huge press brake. This t, with a die length of 18′-8″ and e stroke of 4 inches, has a pres s rating of 900 tons maximum. actual tests it has bent 5/8″ mild st 14 feet long to an inside radius of inch on a pressure of 450 tons.

nother new and very useful tool s e Travograph with attachments. T machine is for flame cutting a matically to template.

otable among the new tools in t new forge and blacksmith shop the new bar shear and the two pneumatic, electric motor drive, contained hammers. Two new type heat treating furnaces in shop are interesting. The large aling furnace has capacity to the largest and longest line or shaft sections. Its length may be led in 3 by two portable parti s and the gas firing arrangement control is such that any one of ections may be used without heat the others or all may be used ltaneously with differing tem ture ranges under perfect control. These furnaces were built by Bethlehem.

Interior, one end of machine shop.

The woodworking shop was practically retooled and fitted with a sprinkler system, and with a new shavings and sawdust exhaust system discharging into an incinerator.

In the machine and erecting shops many new tools are installed including some of the largest on the Pacific Coast. As mentioned above, the new tools and the former tools that were retained are all lined up and located so as to give ample space around each tool. Overhead cranes serve every part of the shop. Railroad trackage and industrial tractor service are brought through this shop from one end to the other. Along the whole west end a modern wash, locker and toilet room has been installed.

In the brass foundry a new gas fired reverberatory furnace has been built by Bethlehem and two new furnaces installed. These latter are 60 inches and 75 inches and are in addition to one 75 inch and one 42 inch already in use. There are also five gas fired crucibles. The melting room is fitted with a ladle car running in a pit through the wall to the casting room. The casting room is equipped with benches and other molding conveniences and with a new automatic temperature control gas fired core oven.

Parking Space

Every modern industrial establishment employing many men has a large parking problem and the Potrero Works of Bethlehem's Union Plant is no exception. As will be noted from the plans herewith, the open space lying between the west side of the machine shop and Illinois Street has been improved as a parking space and equipped with an auto repair plant for company cars. A system of registration and stickers confines use of this area to Bethlehem employees.

With these changes and betterments the Potrero Works of the Union Plant of the Bethlehem Shipbuilding Corporation Ltd. is ready for any new shipbuilding and for prompt and efficient repairs and reconditioning of steel ships and their machinery.

An Interesting Pair All Welded Diesel Electric Tugs

The Defoe Boat and Motor Works of Bay City, Michigan, recently delivered to the Moran Towing and Transportation Company of New York the Thomas E. and the William J. Moran, a pair of all welded steel hull tugs with a very interesting diesel electric propulsion power plan designed and supplied by the General Motors Corporation. The hulls for these boats were designed by Tams, Incorporated, New York, and have the following characteristics:

Length overall—94′ 4½″.
Beam molded—25′ 0″.
Depth—12′ 0″.
Draft—10′ 0″.
Displacement—225-325 tons.
Fuel capacity—26,000 gals.
Berthing capacity—13 officers and crew.
Shaft horsepower—1,000.
Shaft revolutions — 160-200 per minute.

The chief problem which the architects had to solve was that of designing a tugboat equally suited to deep-sea towing and to canal work. Canal work limits the overhead height and at the same time the draft. The solution of the problem was so to distribute fuel tanks that ships can be trimmed to lightest possible draft on an even keel, and fuel cargo reduced to any point necessary down to a draft of about 9 feet. Mats and searchlight are portable, so that they can be stowed, and davits are designed to lower to deck and meet any canal bridge clearance which the bare houses will.

As to the adaptability of the tugs to deep-sea towing, of which they will experience a great deal, they can be fuel or water ballasted to a draft of 11½ feet, and battened down tight from end to end, still permitting the crew to move about with perfect freedom through the interior passageways. The interior arrangement is such that any operation aboard ship except the handling of deck lines can be taken care of; any compartment of the ship is accessible from any other compartment without necessity of outside passage.

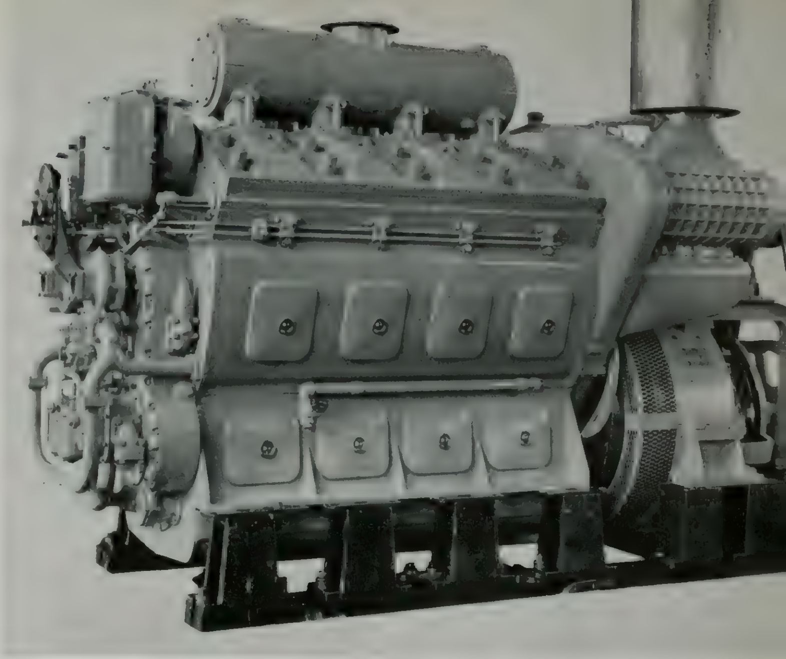
Considerable weight is saved in the design by using all welded construction, and the displacement gain is devoted to extra fuel capacity. Construction consists of transverse frames welded to shell with fore and aft stringers intercostal.

● Propulsion Power Plant

Propulsion power is developed in 2 General Motors Model 8-567, 45° Vee type, 2 cycle diesel engines. Each of these engines has eight cylinders, with a bore of 8½ inches and a stroke of 10 inches, and develops 675 H.P. at 750 r.p.m. This engine has a mean effective pressure of 78.9 pounds per sq. in. and a piston speed of 1250 feet per minute. Each engine is direct connected to a General Electric Model R.P.C., 6 pole, 400 K.W., 250 volt, shunt wound generator, and connected by V-belt to a 24 K.W., 125 volt, 950-1920 r.p.m. shunt wound exciter generator.

Each generator is electrically connected through suitable controls, as shown in the diagram herewith, to a General Electric Model M.P.C., 6 pole, shunt wound motor developing 500 H.P. over a range of speeds from 960 to 1200 r.p.m. Each of these propulsion motors is directly connected to one of the pinion shafts in a Farrel Birmingham two pinion type reduction gear with a 6 to 1 ratio and with teeth and all shafts and bearings designed to transmit the full 1000 horsepower at the lower speed of 960 r.p.m. for the pinions and 160 r.p.m. for the gear. The gear shaft of this set is coupled directly to the single propeller shaft. This gear permits the installation of lightweight, high speed propulsion motors, as well as the low maintenance cost and rugged construction necessary for hard, continuous service.

Diesel-electric tug Thomas E. Moran.



General Motors V-8 model 2 cycle diesel developing 675 H.P. at 750 r.p.m. and direct connected to General Electric 400 K.W. generator.

● Remote Control

The remote control equipment used for regulating the speed and direction of the propeller consists essentially of three pedestal-type operating master switches, a selector switch, and a motorized receiving equipment located in the engine room. This receiving equipment, through suitable mechanical connections, operates the reversing cam controller, the generator field rheostats, and the engine throttle controller.

The three master switch pedestals are located: one on the bridge, one in the pilot house, and one on the after end of boat deck, with a selector in the pilot house which turns over control to any one of these stations or to the engine room. Each master switch controls the strength and direction of the generator field and consequently the speed and direction of rotation of the propulsion motors. The first quarter turn of the handwheel in the clockwise direction applies field to the generators for ahead propulsion. The first quarter turn in the counter clockwise direction applies field to the generators for astern propulsion. The second quarter turn in either direction increases the engine speed from one-half to full speed. There are 15 steps of propeller speed in either direction.

The main generators are fitted with a series winding so that they may be used as motors in starting the main engines. This winding is connected across a 64 volt, 200 ampere hour Exide storage battery by means of contactors controlled by a push button. To start the driving engine the attendant closes this push button and holds it closed until the engine begins to fire. This starting button is inoperative when the main generator switch is closed.

On starting, the diesel generator units will operate at half speed with no field. The generator field is then brought up to full field and the motors follow the speed steps up to half speed. At half speed the field is full. From that point to full speed the control is through engine speed regulation of voltage output. The engine revolutions cannot be increased above half speed until full strength field has been applied on the generator.

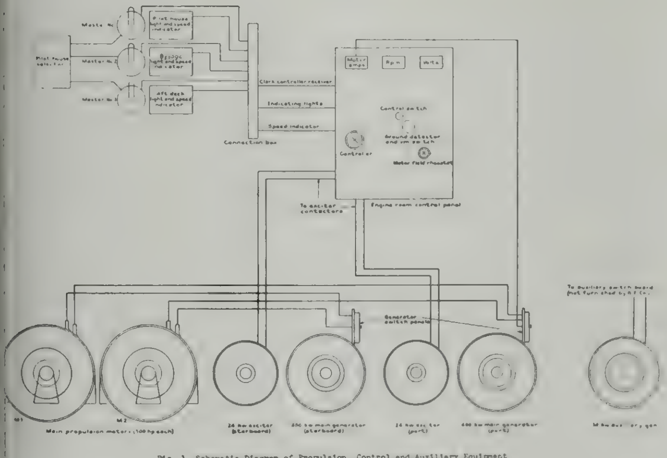

Master No. 1
Pilot house selector
Master No. 2
Master No. 3
Pilot house light and speed indicator
Bridge light and speed indicator
Aft deck light and speed indicator
Clark controller receiver
Indicating lights
Speed indicator
Connection box
Motor amps
Rpm
Volts
Control switch
Ground detector and vm switch
Controller
Motor field rheostat
To exciter contactors
Engine room control panel
Generator switch panels
To auxiliary switch board (not furnished by G. E. Co.)
M1
M2
Main propulsion motors (500 hp each)
24 kw exciter (starboard)
400 kw main generator (starboard)
24 kw exciter (port)
400 kw main generator (port)

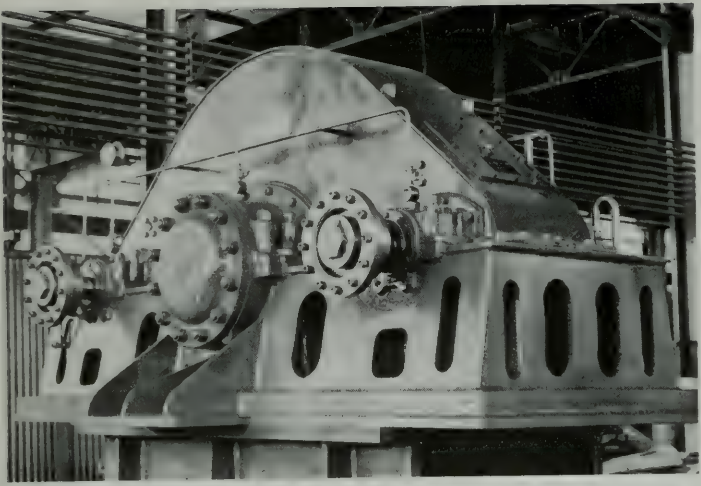
Fig. 1 Schematic Diagram of Propulsion, Control and Auxiliary Equipment Furnished for Each Tugboat

The single screw is a manganese bronze propeller of the 3 blade solid type variable pitch design supplied by the Bethlehem Shipbuilding Corporation.

● Auxiliaries

The two 24 K.W. exciters supply ample power to operate all essential auxiliary machinery and lights. In addition there is installed in each tug a General Motors Model 3-71 two cycle, 3 cylinder, 45 H.P. at 1200 r.p.m. diesel engine direct connected to a General Electric 30 K.W. direct current, self-exciting, compound wound, 125 volt generator. The connected electric auxiliary load includes:

1 Westinghouse Air Brake air com-



Falk speed reducing gear which transmits power from two motors to single screw shaft on diesel-electric tug Thomas E. Moran.

pressor with 2 H.P. motor;
1 American Engineering Company capstan with 12 H.P. motor;
7 Diehl 12 inch oscillating fans for ventilation of quarters;
1 Worthington fire and bilge pump;
2 William A. De Lee water pressure pumps;
1 Fuel Oil service pump;
1 Fuel Oil transfer pump;
1 Frigidaire refrigerator;
1 Benson Electric Company Steeromoter steering gear;
1 Sperry Gyroscope Company 12 inch searchlight.

Other items of equipment include:

Lux CO_2 fire extinguishers supplied by Walter Kidde and Company;

A heating boiler supplied by the York Oil Burner Company;

Radiators by the American Radiator Company;

A tail shaft sleeve supplied by the Sandusky Foundry & Machine Company;

Air ports, dead lights, and deck plates supplied by Torrey Roller Bushing Works;

An oil purifier supplied by the Youngstown Miller Co.;

Plumbing fixtures by the Standard Sanitary Mfg. Co.;

Galley range by Elisha Webb & Son Co. fitted with Valjean oil burner;

Hazard wire rope and hawsers.

The exceptional maneuverability and remote control provided by electric drive are particularly desirable in the service in which these vessels will be used during the greater part of the year—their work will be performed in the close waters of the New York State Barge Canal system, on the Hudson River and Great Lakes. During the balance of the year they will be used in New York Harbor service, which will include the berthing and sailing of such super-liners as the Queen Mary, the Normandie and other large ships of the Cunard and French Lines, with which the Moran Company has contracts.

Water Cooled Mercury Vapor Lamp

A 1000 watt lamp no thicker than a lead pencil is offered by the Westinghouse Lamp Division, Westinghouse Electric & Manufacturing Company. A new principle is employed, mercury vapor in a very small "capillary" tube of quartz, operating at a very high pressure and water-cooled. The light it gives is exceedingly intense and concentrated.

This unique lamp is expected to be invaluable for use in photoengraving and other photographic processes as well as in searchlights and for therepeutic uses. Its rays are highly actinic and the amount of light emitted is high, 65,000 lumens. Moreover, since such a concentrated source ca be focused with great accuracy, i should find appliation in many othe projection fields. It is about 1 times as brilliant as a filament pro jection lamp. Never before has suc a powerful, yet tiny, source of s high intrinsic brilliance been available.

The new lamp consists of a quart tube about one-fourth inch in outside diameter, with a bore diameter o about one-twelfth of an inch. Th tube contains a globule of mercur and is capped at each end with a bras ferrule which serves as a terminal Wires project from each ferrule int the bore, leaving a gap of about on inch. In operation the lamp is to b surrounded by a glass jacket throug which water is circulated. The de sign of this jacket will depend upo the maker of the equipment which in corporated the lamp.

This lamp may be operated o either direct or alternating current Its voltage drop is about 840, at 1½ amperes. Being a mercury arc lamp it requires a ballast resistance whe used on direct current, and a ballas impedence or ballast transforme when used on alternating current. I comes to full brilliance in one or tw seconds. Its life when operated in horizontal position on a schedule o 25 minutes on and 5 minutes off wil be 50 hours.

Initial research on this type of capillary lamp was conducted by Philip Glow Lamp Works of Eindhoven Holland; subsequent research and development in the Westinghouse Laboratories in Bloomfield, New Jersey The lamp is coded type H-6. Both engineering and commercial information upon it may be obtained fron the Westinghouse Lamp Division Bloomfield, New Jersey.

BOOK REVIEW

Wrought Iron, by James Ashto and Edward B. Story. Published b A. M. Byers Co. Price $1.00.

This excellently printed, beautifully illustrated book describes, i eight chapters covering 60 pages the manufacture, characteristics, an applications of wrought iron. Copie are available from P. D. Tabler, Sa Francisco representative of A. M Byers Company, at Rialto Building

National Defense

(Continued from Page 21)

nts made with former transatlantic carriers of different type and capacity.

oastwise the great passenger servic of the past are no more.

ranspacific there are no more American freight lines, the passenger ships lie tied to the docks in Seattle, and only one great passenger and mail liner has steadily operated from San Francisco and Los Angeles.

Now to our point. The United States is not a militaristic nation. With the bristling speeches and threats of war, it is but natural to speak and think of militaristic and naval defense. But what is of more real and lasting import to the United States as a world power, politically, financially, and economically, is our national economic defense; the protection of our overseas trade by a modicum of suitable, modern, economic, safe and popular vessels, furnishing a maximum of service with frequency of sailings and adequate to protect that trade during national or international stress, whether the United States is a combatant or a neutral.

We are informed that some thirty million of people in the United States largely depend upon foreign trade and shipping for their gainful livelihood. They are entitled to know that they may carry on, no matter what happens overseas. The World War gave us a scare in that foreign ships were withdrawn. If that had been the only time, it should have been warning enough. But the Spanish-American War, the Boer War, the Russo-Japanese War, and the British coal strike also immediately affected us. So the United States Congress wisely passed laws to create sufficient and adequate shipping. That some of these laws are too restrictive is beside the point. These restrictions will undoubtedly be smoothed out by trial and discovery of errors. The point is that as a nation we are committed to a program of adequate merchant marine power. We are determined to heed the statement that "Those who cannot remember the past are condemned to repeat it."

To some of us it may seem that we are making haste slowly; that we are losing the ground that we have so laboriously developed at a tremendous cost. Be that as it may, we are on our way, and the fulfilment of our definite mandate will take its natural course.

It has been suggested that a fifty-ship program per year is that which we should contemplate. It is doubtful if this will suffice, unless additional building is undertaken by coastwise and intercoastal and industrial lines. It would seem that a program four times that large would more directly serve the nation's need. To accomplish this it would undoubtedly be wise to study independently and eventually collaborate with private coastwise and other owners to modernize their fleets through low interest loans and means of attractively disposing of their ships to be replaced.

Here, on the Pacific Coast, we need an adequate fleet of ships to serve the route from Seattle to the Orient. Another to serve the route from Portland to the Orient. And another freight line of economical ships from San Francisco and Los Angeles to the Orient and Australia. This is besides at least three large cargo and passenger carriers of the President Coolidge type from San Francisco and Los Angeles to the Orient. Then there is the fleet of new ships required for around the world; and another fleet for the East Coast of South America; one to the West Coast of South America; and possibly one to Central America.

Certainly the Pacific Coast cannot be satisfied with the limited passenger and cargo accommodations intercoastally. Our traveling public should have the opportunity of sailing on American ships between American ports in American style and comfort.

Coastwise the conditions have, we think, changed materially. The old-time ship has been outmoded by the trucks, the buses, the streamlined trains, and the airplane. Yet there are still a lot of people that would prefer to travel by boat. Here speed is again essential. There should be a ship out of San Francisco and Los Angeles every day between these two points. They would have to be overnight vessels. Every-day service would be essential. From Seattle to San Francisco and Los Angeles there should be two ships per week, with a weekly turn around. Ambitious, yes.

And then we have the Pacific Coast-North Europe service that should also be served with the proper type of American ship.

The scope of this article does not permit of going into details about the type of ships required for each service. Suffice it to say that each service must be studied as to its passenger requirements, as to type and quantities of cargo, frequency of service, speed based upon transit time , fuel requirements and its availability, competition, and future prospects. To evolve one or two types of ships for all services would be a mistake, and to consider any sort of tramp service is out of the question. The ships must be the cargo liner type, or the combination passenger cargo liner type, and each must be outfitted for passenger space, refrigerated space, deep tank space, mail rooms, bullion rooms, and other special compartments in accordance with the trade route requirements.

The thing to bear in mind is to build ships for the economic defense of the United States. If we build primarily for military defense we may shut our eyes and reason to the peaceful and good-neighbor purpose of these ships. They should be at once the harbingers of good-will and so outfitted that the minimum time is required to prepare them for the more sinister purpose of war, should we be forced into a position of military defense.

We have taken the lead, so ably handled by the Secretary of State, Mr. Hull, in the new development of overseas trade, wherein all sides benefit by means of reciprocal treaties. Our trend is now away from self-sufficiency, with its concomitant blare of force and bluster, to the exchange of commodities as best developed by each nation—commodities that are now so needful as to take them out of the luxury class and make them requirements for our welfare and happiness.

NEWEST PACIFIC COAST TANKER,

Union Oil Company's Oil Carrier Nearing Completion at Sparrows Point

The illustrations herewith show that rapid progress is being made at the Sparrows Point Plant of the Bethlehem Shipbuilding Corporation, Ltd., on Hull No. 4334, the 13,000 deadweight tons tanker building for the Union Oil Company of California. A fairly complete general description of this vessel appeared in the June, 1938, issue of Pacific Marine Review, and for information on the structure of the hull our readers are referred to that article.

Since June additional details have been released, and this article sets forth mainly details of machinery and auxiliaries not available for the June issue.

The general characteristics of this ship are:

Length overall—463′ 0″.
Length B. P.—442′ 0″.
Beam molded—64′ 0″.
Depth molded U. D.—34′ 10″.
Sheer for'd at F. P.—10′ 0″.
Sheer aft at A. P.—5′ 0″.
Camber upper deck—0′ 16″.
Des. load draft molded—28′ 4″.
Displ. at that draft—16,968 tons.
D.W. at that draft—13,000 tons.
Normal shaft horsepower—3,500.
Trial speed loaded—13 knots.
Capacity cargo (gas.) 98%—101,400 bbls.
Capacity for'd deep tank—3,950 bbls.
Capacity after bunker—5,700 bbls.
Steaming radius—20,000 miles.
Cap. F.W. double bottom—119 tons
Cap. drinking water—80 tons.

She will be of the single screw, three island, American tanker type with raked stem and cruiser stern. Her cargo tanks are formed by 10 transverse and 2 longitudinal bulkheads giving 27 cargo oil compartments. Construction is on the Bethlehem-Frear system of fluted transverse bulkheads and connected longitudinals.

● Propulsion Machinery

A set of Bethlehem cross compound turbines taking steam from two oil fired water tube boilers drive the single screw through double reduction gearing.

The boilers will be Foster Wheeler D type each with a capacity for evaporating 24,500 pounds of steam per hour at 400 lbs. pressure and 750°F. temperature. The boilers will be installed on a flat aft of and above the turbines. They will be equipped with built in economizers, superheaters, desuperheaters, and soot blowers. A complete system of boiler draft and combustion control and of feed water treatment will be installed by the Hagan Corporation.

Two blowers for forced draft will be supplied by the B. F. Sturtevant Company. Each of these will have a capacity for 1200 cubic feet of air per minute at fan speeds from 825 to 1650 r.p.m. Todd oil burners will be used.

For check on combustion a Ranarex mechanical $C.O._2$ indicator and a distance reading stack thermometer will be fitted. A McNab salinity detector will check the feed water and the condensate. The two boilers, at normal rating, will provide steam for normal full power operation of the propulsion equipment. Sufficient overload capacity, however, is available to permit simultaneous operation of the Butterworth tank cleaning system.

Superheated steam at full boiler pressure will be supplied to the main turbines and, normally, to the generator turbines. Desuperheated steam at full boiler pressure will be supplied to the turbine driven main feed pumps, reciprocating auxiliary feed pump and to the generator turbines. Reduced pressure desuperheated steam will be supplied for all other services. Provision will be made for operating generators and other necessary auxiliaries with low pressure shore steam when in port with boilers secured.

The main propulsion unit will consist of one high pressure and one low pressure turbine, of the latest Bethlehem Shipbuilding Corporation design, built at the Fore River Plan and driving the propeller through Falk gears. The unit is designed t deliver 3500 shaft horsepower at 8 r.p.m., utilizing 375 pounds gage pressure and 725°F. total temperature steam to turbines, with 28¼ inche Hg. vacuum at exhaust flange.

The high pressure turbine will be of the combined impulse and reaction type and the low pressure turbine o the single flow reaction type. An astern turbine, capable of developing ample torque for maneuvering the vessel, will be fitted in the low pressure ahead casing.

Connections, with the necessary fittings and portable pipe, will be provided to permit operation of either turbine singly in event of an emergency.

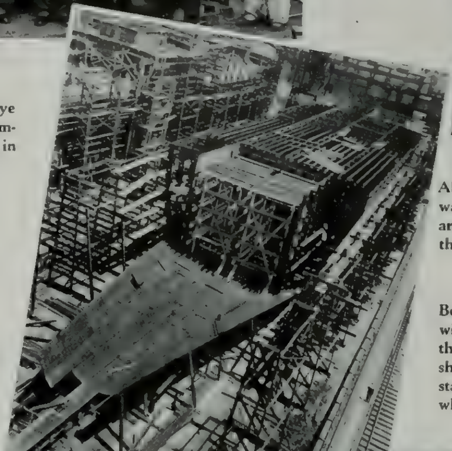
The main reduction gear, manufactured by the Falk Company, will be of the double reduction, double helical tooth, articulated type. The gear case will house also the Kingsbury main thrust bearing and will moun a reversible motor driven turning gear.

The low pressure turbine will exhaust downward to the main condenser installed athwartship beneath the turbines. Main and auxiliary condensers will be designed and constructed by Bethlehem.

During operation at sea, the main condenser will handle main turbine and generator exhaust steam together with any excess auxiliary exhaust admitted under control of an automatic exhaust back pressure valve, and the auxiliary condenser will be normally secured. In port the auxiliary condenser will receive generator turbine exhaust and will handle any excess auxiliary exhaust admitte through an automatic back pressure valve.

Left: Standing on the shell plates of the new Union carrier are, left to right: A. O. Pegg, Wm. Groundwater, Mr. Carlson, Mr. Hodges, assistant supt. of construction, Mr. Valentine, W. L. Stewart, Jr., Mr. Ord, Mr. Gladding, supt. of hull construction, and James Stewart, hull inspector.

Above: Messrs. Wm. Groundwater and W. L. Stewart, Jr., are photographed standing in the stern keel plate of the ship.



Right: A bird's-eye view of the company's new ship in the making.

Below: A. O. Pegg, W. L. Stewart, Jr., Wm. Groundwater, and James Stewart inspect the front cofferdam section.

Below: Inspecting the welded wing bulkhead at forward end of the engine room. The wood shown in these pictures is merely staging and is, of course, removed when the steel structure has been completed.

Pictures taken June 13, when W. L. Stewart, Jr., vice president Union Oil, and William Groundwater, director of transportation, visited the Bethlehem Shipyard at Sparrows Point, Maryland.

Power Plant Auxiliaries

Motor-driven Worthington circu- ting pumps will be installed for con- nser service; one vertical unit for e main condenser, and one hor- ntal unit for the auxiliary.

Foster-Wheeler main and auxiliary r ejectors will be provided for re- oving air from the condensers. The ain unit will be of the twin two- ge type and the auxiliary unit will ve two single stage jets.

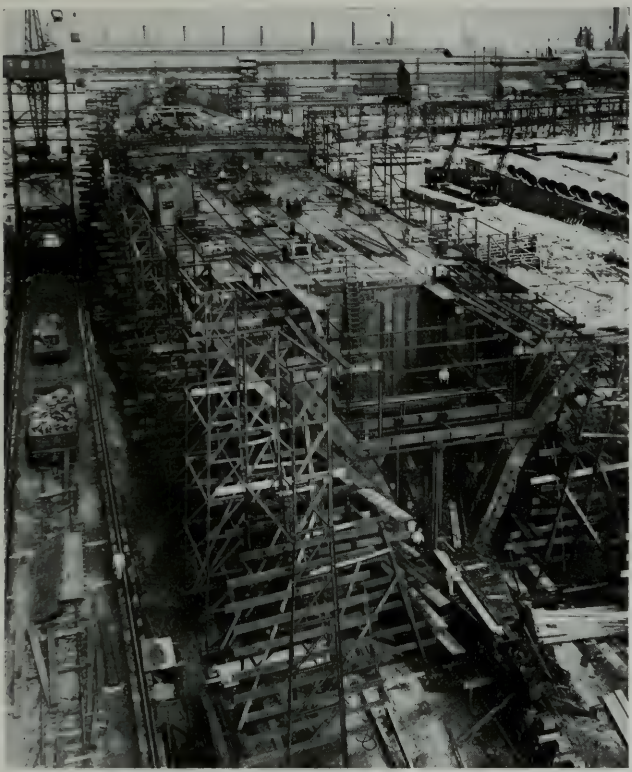
In the interest of obtaining com- te deaeration of boiler feed water, totally closed feed system will be stalled.

Two Worthington combined motor-driven condensate and condensate booster pumps, arranged to take suction from either condenser, will be provided. The booster pumps will discharge through air ejector inter and after condensers, feed heater drain cooler and feed water heater to the feed pump suction line. A closed surge tank, provided with a vacuum connection to the condensers, will be connected to the common condensate discharge and booster pump suction line.

All steam drains are collected and eventually pass through the condenser to provide as complete deaeration as possible.

Two Worthington main feed pumps, close coupled to Sturtevant driving turbines, and one Worthington reciprocating, steam-driven auxiliary feed pump will be provided. Each main pump will deliver water at a rate sufficient for simultaneous overload operation of two boilers.

One feed heater, with a drain cooler, will be provided in the booster pump discharge line, and will use auxiliary exhaust steam replenished by bleeder steam from the main turbines.



Progress picture taken August 1. Unfinished stern and machinery space in foreground.

The main turbine lubricating oil system will be of the gravity type. One Northern rotary, motor-driven oil pump will draw from a sump tank under the reduction gear case and discharge, through a lubricating oil cooler, to the oil supply line to bearings and oil sprays. A gravity tank will be connected in the supply line to provide for constant pressure and for reserve supply in emergencies. Gravity tanks and lubricating oil coolers will be supplied in duplicate, one of each for standby, and a Worthington vertical simplex steam pump will be fitted as a standby service pump.

One 150 gallon per hour De Laval Unimatic lubricating oil purifier, with a separate steam heater, will be provided for continuous or batch purification of oil.

Two Northern rotary motor driven fuel oil service pumps and two fuel oil heaters will be provided; one of each will be capable of serving two boilers during overload operation, the other units being secured. A Worthington horizontal duplex steam pump in the engine room will be arranged for fuel oil transfer duty and as a standby for the service pumps.

● Electric Power Plant

Electric power service for the vessel will be supplied by two 240 volt D.C. Westinghouse geared turbo-generator sets and distributed through a Westinghouse main switchboard.

Two General Electric 230/120 volt motor generators will serve the lighting system.

General Electric motors and controls will be furnished for motor-driven auxiliaries in the engine room and for cargo pumps.

● Cargo Pumps

A very flexible pumping arrangement of the Union Oil Company design has been installed. The system provides for handling three commodities at one time and the combined pumping rate will be approximately 9000 barrels per hour. It is also arranged for separate loading of each cargo tank without flooding back through bottom suction lines.

To serve this system three main cargo oil pumps will be installed and one stripping pump. All of these pumps will be of Kinney design and manufacture and each of them will be driven by a Whiton turbine. The pump room ventilation will be effected by an American Blower Company fan driven by a Coppus Engineering Company steam turbine.

● General Service Auxiliaries

Worthington pumping equipment will be provided for all water services. One centrifugal fire pump, driven by a diesel engine, one centrifugal motor-driven general service and ballast pump, and one motor-driven centrifugal sanitary pump will be installed in the engine room, together with two -motor driver plunger units for potable water and wash water hydro-pneumatic service, one horizontal duplex steam-driven general service and ballast pump, and one horizontal duplex steam-driven evaporator feed pump. A vertical duplex steam-driven fire, bilge and ballast pump will be installed in the forward pump room.

Worthington duplex steam pumps will be provided for fuel oil transfer; one vertical unit for the forward pump room, and two horizontal units in the engine room.

A Davis Engineering Company 15-ton capacity evaporator and a distiller of the same make and capacity will be fitted in the engine room and arranged for making potable water from sea water and for pre-evaporation of raw feed water. Davis Engineering Company supplied also the fuel oil and lube oil heaters and the lube oil coolers.

A motor driven gland exhauster, with condenser, will be fitted to serve the main turbine glands.

Workshop tools will be installed on a flat in the engine room. A Rahn-Larmon heavy duty lathe, a Sibley vertical drill press, and a Hisey-Wolf double wheel floor grinder, with individual motor drivers, will be provided.

Compressed air for automatic controls, air operated tools, and other miscellaneous services will be supplied from an air receiver charged by a Worthington motor-driven compresr with a standby connection from a estinghouse steam-driven com- essor.

Refrigerator spaces for food storge will be cooled by a Carrier Brunsick direct expansion ammonia plant. his plant is designed to maintain itable storage temperatures in the ip's stores, refrigerators and to cool inking water for the crew. The ant is operated under manual conol with the exception of the vegeble compartment, which has autoatic control. A scuttle butt will be stalled to supply cool drinking ater in the machinery spaces and ter crew's passageway.

Fire Protection

The engine and boiler room spaces e protected against fire by the Lux rbon dioxide system. Twenty-six -pound capacity Lux cylinders are nveniently stowed in the steering ar space. The controls for operaon are in the crew passage connient to an exit from the spaces otected.

Cargo oil tanks are protected by a nion Oil Company system of flue s coverage. In this system the flue ses are washed and cooled and ed to fill the ullage spaces at the p of the oil tanks.

Navigation and Communication

Mackay Radio and Telegraph Company will supply the radio equipment for this tanker. In the radio room there will be installed a 200 watt intermediate frequency transmitter, a 200 watt high frequency (short wave) transmitter, a 50 watt emergency transmitter, and receiving equipment consisting of one all-wave main receiver, one stand-by intermediate frequency receiver and a crystal receiver. Also in the radio room there will be a panel on which will be mounted the Mackay Radio auto alarm, power supply and main feeder switch boxes and control units. All wiring will be installed in deck and deckhead channels with the bulkheads left entirely free and clear.

Mackay Radio is also supplying the type 105-A Kolster Radio Direction Finder, which will be installed on the bridge.

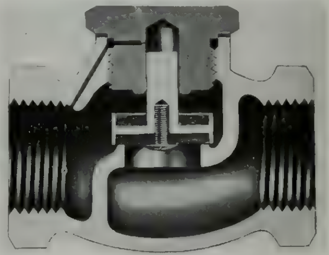
The navigation equipment will be complete, including: Sperry Gyroscopic master compass and three repeaters; Sperry course recorder; Sperry Gyro Pilot; Submarine Signal Company Fathometer; and an electric sounding machine.

The steering gear will be the American Engineering Company spring-quadrant type with hydraulic telemotor and electric controls. American Engineering Company will supply four steam capstans, two cargo winches, two large steam warping winches, and a steam windlass.

Naco cast steel stud link anchor chain will be furnished by the National Malleable & Steel Castings Company.

Leslie "Tyfon" whistles will be installed and Leslie automatic control for fog signaling.

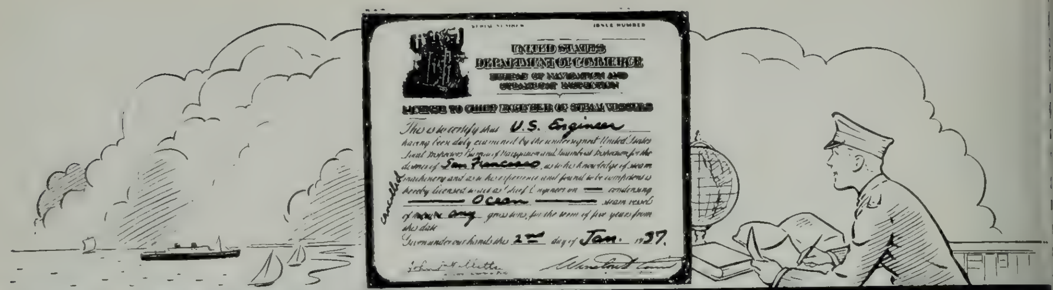
Progress picture taken September 12



A Valve That Eliminates Air Hammer

Irritating noise and destruction due to valve hammer in air lines are said to be completely eliminated by a check valve that operates on a new principle. The moving valve, made of bronze and brass bar stock, is so constructed as to be held in suspension by the suction created above the valve stem by the flow of the air itself past the siphon hole in the valve body.

When the compressor is operating under normal conditions, the check remains open and the air passes freely and quietly into the receiver. When the compressor stops, the vacuum above the stem is broken and the valve returns to its seat. This action naturally eliminates the valve hammer common to all ordinary valves. C. A. Norgren Co., Inc., the manufacturers, point out that this valve has longer life and maintains compressor efficiency. The valve is easily serviced by the simple replacements of inexpensive disks.



UNITED STATES
DEPARTMENT OF COMMERCE
BUREAU OF NAVIGATION AND
STEAMBOAT INSPECTION

LICENSE TO CHIEF ENGINEER OF STEAM VESSELS

This is to certify that U.S. Engineer

San Francisco

Ocean

Jan. 1937.

Cancelled

Your Problems Answered

by "The Chief"

The word "Cancelled" was inscribed on face of the above license at the direction of the Bureau of Marine Inspection and Navigation. As used here it means "Specimen Copy."

More Points on Plant Improvement

H. T. L. of Los Angeles writes us, giving four different suggestions for power plants afloat. His remarks and questions are well worth discussion, and are submitted herewith. Discussion by "The Chief" will follow each suggestion. He writes:

"In reading about some of the new power plants and modernization of existing plants, I have naturally developed a number of ideas. As I have no way of trying out any of these ideas by practical tests, I have decided to write them up and send them to you for comment or use as you see fit."

This is exactly what this column is designed for. We hope more readers will try out their ideas on "The Chief."

IDEA No. 1

When superheaters are added to boilers supplying steam to reciprocating engines, there is a limit to the temperature at which steam may be admitted to the high pressure valve chamber. Now suppose that we use a high degree of superheat, install a reheater between the H. P. and the I. P. cylinder, and in cooling the high pressure steam down to a practical working temperature reheat the H. P. exhaust and utilize this heat in the I. P. cylinder.

This is a real idea but must be carefully examined.

If we were to superheat to 750° F. and use steam at the nominal pressure of, say, 300 pounds abs., we find by reference to the total heat-entropy diagram that we would be exhausting superheated steam to condenser at our nominal 26-inch vacuum.

The advantages of superheat do not appear unless we increase pressure with temperature, so that the high temperatures would need high pressure engines, say over 450 pounds abs. This means special design engines and eliminates use of this idea on modernizing present engines.

Also assume we were to use only a moderate superheat, one which would best suit the nominal pressure of the engines we have. Here again we would not get the improvement we anticipated because the increased temperature requires an increased expansion ratio. There will be an increase in volume in both the I. P. and L. P. cylinders, which only a longer stroke or greater areas will accommodate. Looking at it another way, granting that superheat gives better efficiency and more expansion, we need shorter cut-off in I. P. and L. P. to get it, or must pass less steam through H. P. to be able to use I. P. and L. P. to best expansion ratio. This would give a badly unbalanced engine, with H. P. cylinder not doing its share of the work.

No advantage of reheat is gained unless we reheat into the superheat zone.* Any superheat at all, regardless of whether in H. P. or I. P. or L. P. cylinder, has the same objection, i.e., no water present to lubricate the piston and cylinder.

Furthermore, the principal loss in the reciprocating engine is in the condensation on the cylinder walls which one moment are cooled by being washed with exhaust steam and the next moment are being uselessly heated by the live steam. This loss will be increased by the use of higher temperature steam.

In other and simpler words, the answer is, it is not the temperature of the steam that bothers the reciprocating engines — it is the superheat. There is no merit in drying out the steam admission to I. P. and L. P., and this would unbalance the engine so that a special design is needed. Assuming willingness to go to special design, we have the cost and weight of a heat exchanger at high pressure with no improvement in economy.

IDEA No. 2

When a turbine is installed between the L. P. cylinder and the condenser, we increase the efficiency of the main engine, which is already

---

*This is true with reciprocating engines not true with turbines. There is a marked improvement in turbine efficiency by drying out the wet steam, thus preventing so-called wet losses or blade loss due to moisture on them.

**e most efficient piece of equipment
the engine room. Now, if we
ctrify the engine room auxiliaries
must provide a means of heating
boiler feed water. It appears to
that this might be accomplished
either of two methods:**

**(a) Install a turbine generator set
th turbine designed for bleeding
two or three stages and the ex-
cted steam utilized in the feed
ter heater.**

**(b) On the same shaft as the ex-
ust steam turbine install a small
h pressure turbine to take steam
ectly off of the boiler. This tur-
e, like the one in (a), should de-
er steam at two or three pres-
es to the feed water heaters. In
s case the load on the turbine
uld be adjusted so as to deliver
actly the amount of steam re-
ired for feed water heating, while
wer developed by the turbine
uld assist in increasing the power
ivered to the propeller.**

he only major difference be-
een (a) and (b) is that in one the
wer from steam expanded down
feed heating is delivered to aux-
ries, and in the other it is deliv-
d to propeller.

he scheme in (a) would have to
augmented with control to take
ying auxiliary load by either con-
sing for more load than feed
am would generate, or by reduc-
valves to augment feed steam if
d did not pass sufficient. Which
these we will see as follows. With
explanation of their difference
can discuss both schemes to-
her.

he point overlooked here is the
at quantity of steam required for
d heating. Assuming 300 pounds
square inch abs. as a nominal
ssure, we find a total heat of 1202
T. U. per pound divided between
B. T. U. heat of evaporation and
heat of the liquid.

f we really go after this economy
stage feed heating we must add
rly one-third of our total heat to
water. This means a step extrac-
system bleeding much more
m than the auxiliary power tur-
e would supply. And so much in
that if we were to build a tur-
large enough to permit extrac-
, assuming its exhaust all used
the first stage heating, we would have another plant so big that we would need more boilers, or run the reciprocating engine underloaded. If we start a new design, we would not consider this because a turbine for main drive offers this advantage directly. The exhaust turbine system is primarily for modernizing existing plants. It adds to the power of the plant without taking more steam. The method suggested would take more steam and require an increase in the size of the plant, a move not desirable in modernizing.

IDEA No. 3

On some ships a generator is driven by the main turbine to carry the auxiliary load at sea. A turbine generator set motors on the line ready to take up the auxiliary load if the main turbine should slow down or stop. Is this arrangement superior to a turbine generator driven by the main turbine through either a magnetic or an overrunning clutch?

The system referred to is now being used on three of the Grace Line ships, as well as others, and has been described in this section recently.

The magnetic clutch would have to be controlled by a relay or some device so that it would release when the small turbine tried to run the big turbine. Otherwise the schemes are all about the same functionally. It then would be decided on a basis of cost of building and mechanical arrangement. It is possible to add an "attached" generator to the main gear set, but to increase this "attached" machine to a turbine and gears would seriously disarrange the now well organized engine room. The piping, drains, and other attachments would make a difficult job. It is assumed that a good reliable overrunning clutch "free wheeling" is available in the sizes which would be required. This seems doubtful at present.

The comparison of these schemes is one of practicability, cost and arrangement, and further discussion can add little.

IDEA No. 4

Where a greater increase in power is required than can be obtained by merely adding an exhaust turbine, add also a high pressure turbine of the required additional power. Then alter the boiler plant in one of two possible layouts:

(a) If it is desirable to retain the existing boiler plant, add a high pressure water tube boiler at 400 pounds or higher, and use steam from this boiler to the high pressure turbine, designed to bleed part of its steam to the existing main steam header.

(b) If it is preferred to replace the existing boiler plant with entirely new boilers, use the H. P. turbine as a reducing valve to reduce the pressure of all the steam to the proper pressure at the throttle of the reciprocating engine.

Both of these schemes have been put to good use in stationary plants, the same except perhaps having a turbine in place of the reciprocating engine. The problem of raising the power of a plant by increasing the steam pressure is not new nor difficult where there is plenty of space. There are dozens of different combinations of high and low pressures, bleeding turbines, exhaust turbines, topping turbines and special combinations.

The problem of the marine plant is entirely different. It is either a case of modernizing an existing plant, or an entirely new design. If modernizing, there seldom, if ever, will be room for additional boilers or turbines. This would eliminate at once the schemes presented. If a new design or if the old plant is to be scrapped or an entirely new one put in, it would be the simple steam turbine with extraction for feed heating, or certainly not a combination design.

Although the Bauer-Wach system is a so-called combination system, its beauty and suitableness lie in the fact that nothing need be done to the boiler plant, and the changes to the engine room are of the simplest kind and relatively easy. Also in that such a large gain in horsepower is made at so little cost in space and weight.

In Ideas 1, 2 and 4 the case of each individual installation would require an investigation of all the factors involved because it would be impossible to make a general design that would operate satisfactorily in all ships.

**Yours truly,
H. T. L., Los Angeles.**

Yes, every case must be studied individually. Let reader L—— give more thought to the entirely new plant, looking toward reducing the fuel requirement to compete with the diesel ship. The last word is not yet spoken as to development of the steam plant for the ship of the future.

"The Chief" is very glad to discuss engineering with our correspondents, and invites others to write in.

Bauer-Wach Exhaust Turbine System

In order to clear up any misunderstanding which may have arisen from statements by "The Chief" on application of exhaust turbines on marine reciprocating steam engines, the editor has compiled the following information from various authentic sources.

From the years 1907 to 1914 a number of large vessels were fitted with three propellers. The two outside shafts were driven by reciprocating engines and the central shaft driven by a turbine using the exhaust steam from both of these engines. These plants were very economical in fuel and experience with them emphasized the practical possibilty of utilizing the immense heat energies liberated by the expansion of steam under very low pressures.

Several years after the close of the World War, Dr. Bauer and Dr. Wach, German engineers, took out patents for the application of exhaust turbines to reciprocating engines, combining the power of both turbine and engine on the same shaft, the turbine being connected through reduction gearing and a hydraulic coupling. The first application of these patents on shipboard was in 1926. Up to December 1, 1937, over 500 vessels had been equipped with Bauer-Wach system exhaust turbines. These vessels had a combined total shaft horsepower of over 1,500,000, or an average of 3,000 shaft horsepower.

The results from these applications have been very satisfactory. Reduction in steam consumption for equal power has varied from 18 per cent to 30 per cent, the majority of the

(Page 47, please)

Engineers' Licenses

The following list shows the licenses granted during the month of August to engineer officers of the merchant marine at Pacific Coast offices of the Bureau of Marine Inspection and Navigation:

JUNEAU

Name and Grade	Class	Condition
Cyrus A. Willikson, Chief Eng.	OSS, any GT	O

SEATTLE

Name and Grade	Class	Condition
Albert A. Rothenbuhler, Chief Eng.	OSS, any GT	O
James B. Skoog, 3d Asst. Eng.	OSS, any GT	O

PORTLAND

Name and Grade	Class	Condition
Kenneth H. East, Chief Eng.	OSS, any GT	RG
Erwin R. Rehm, Chief Eng.	OSS, any GT	RG
Cyrus A. Willikson, Chief Eng.	OSS, not over 2000 GT	RG
2nd Asst. Eng.	OSS, any GT	
William G. Saunders, 1st Asst. Eng.	OSS, any GT	RG
Elmo E. Bland, 2nd Asst. Eng.	OSS, any GT	RG
Joseph F. Hubal, 2nd Asst. Eng.	OSS, any GT	O
Ralph W. Northern, 2nd Asst. Eng.	OSS, any GT	RG
James N. Server, 2nd Asst. Eng.	OSS, any GT	RG

SAN PEDRO

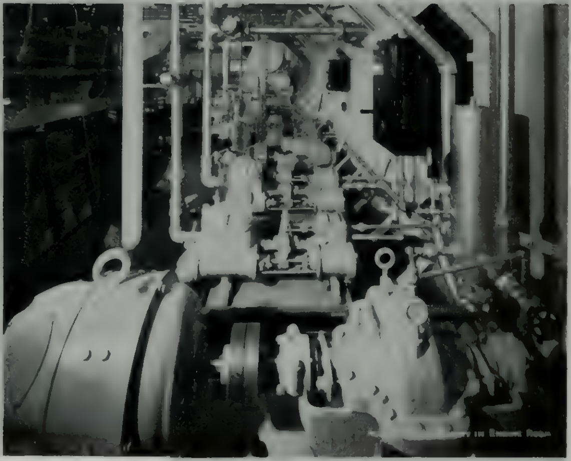
Name and Grade	Class	Condition
William E. Samuel, 2nd Asst. Eng.	OSS, any GT	O

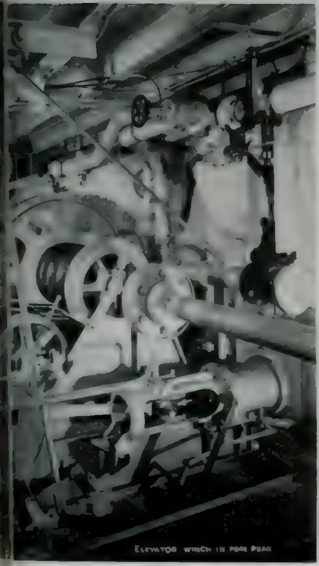
SAN FRANCISCO

Name and Grade	Class	Condition
Lawrence Dake, Chief Eng.	OSS, any GT	RG
James H. Schaefle, Chief Eng.	OSS, any GT	RG
Rudolph Schmitz, Chief Eng.	OSS, any GT	RG
John Courtney, 1st Asst. Eng.	OSS, any GT	RG
William K. Petersen, 1st Asst. Eng.	OSS, any GT	RG
Leo F. Seller, 1st Asst. Eng.	OSS, any GT	RG
Lyal E. McNamire, 2nd Asst. Eng.	OSS, any GT	RG
Harry E. Morgan, 2nd Asst. Eng.	OSS, any GT	RG
Louis D. Rhea, 2nd Asst. Eng.	OSS, any GT	RG
William B. Bellamy, 3d Asst. Eng.	OSS, any GT	O
Richard H. Brannon, 3d Asst. Eng.	OSS, any GT	O
James A. Butts, 3d Asst. Eng.	OSS, any GT	O
David W. Coker, 3d Asst. Eng.	OSS, any GT	O
Guy D. Conover, 3d Asst. Eng.	OSS, any GT	O
Robert S. Duncan, 3d Asst. Eng.	OSS, any GT	O
William M. Gough, 3d Asst. Eng.	OSS, any GT	O
Charles R. Hake, 3d Asst. Eng.	OSS, any GT	O
George W. Hill, 3d Asst. Eng.	OSS, any GT	O
Edgar C. Howell III, 3d Asst. Eng.	OSS, any GT	O
Richard P. Huber, 3d Asst. Eng.	OSS, any GT	O
Bertram R. Irving, 3d Asst. Eng.	OSS, any GT	O
Howard L. Mollenkopf, 3d Asst. Eng.	OSS, any GT	O
Elmer B. Palmer, 3d Asst. Eng.	OSS, any GT	O
William M. Putnam, Jr., 3d Asst. Eng.	OSS, any GT	O
Edward C. Schwarz, 3d Asst. Eng.	OSS, any GT	O
Walter H. Secrest, 3d Asst. Eng.	OSS, any GT	O
Kenneth G. Soderlund, 3d Asst. Eng.	OSS, any GT	O
Felician Tavares, 3d Asst. Eng.	OSS, any GT	O
Kelshaw Taylor, 3d Asst. Eng.	OSS, any GT	O
Leslie F. Leghorn, Chief Eng.	OSS, any GT	RG

Abbreviations: GT is gross tonnage; RG is raised grade; O is original license; OSS is ocean steamer; OMS is ocean motorship.

M. V. KOMOKU AND SOME OF HER MACHINERY





❖

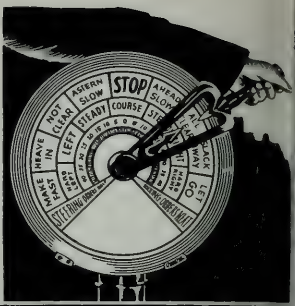
M. V. Komoku is a practical transportation unit designed for the economical delivery of refined sugar to various points on San Francisco Bay and its tributary river systems. She was built by the Moore Dry Dock Co. to designs by Pillsbury & Curtis for the Bay and River Navigation Co. A complete description of this boat was published in the September issue of Pacific Marine Review. This page of pictures shows some of her interiors with machinery installed. These photos were not available when September issue went to press.

Photos by Gabriel Moulin

❖

Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A DEPARTMENT FOR DECK OFFICERS

Editor's Note: Our apologies to the deck officers for the lack of continuity in this installment of their section. The writer responsible for this column was suddenly transferred without warning and the editor had to fill in with the material available. Other arrangements have been made and next month's issue will see this section up to a new standard.

INSTRUCTION IN USE OF GAS MASKS

In order to reduce fatalities resulting from asphyxiation aboard ship, and to increase the proficiency of fire-fighting in enclosed spaces, the Bureau of Marine Inspection and Navigation, Department of Commerce, has just begun an intensive campaign to further the training of merchant marine personnel in the correct and efficient upkeep and use of the oxygen breathing apparatus, the fresh air mask, gas mask, flame safety lamp, gas concentration detectors and methods of artificial respiration.

One of the Bureau's principal traveling inspectors took a course of instruction on these devices at the Bureau of Mines, Pittsburgh, Pennsylvania. Thereafter he visited the offices of the local inspectors of the Bureau of Marine Inspection and Navigation, which are located in all the principal ports in the Unted States, including the Great Lakes and the Western rivers. Incident to this tour the traveling inspector instructed all of the Bureau's inspectors in the use of this apparatus to the end that the local inspectors may give instruction to ship's officers and others concerned.

Officials of the Bureau believe that the application of this instruction will result in the saving of many lives aboard ship, the Commerce Department announced.

LOST BUOY BROADCASTS ITS POSITION

When a ship locates her position by signals from a buoy, that is not news. When a buoy goes astray and is tracked down from signals it sends to the ship, that IS news.

Leo Otis Colbert, Director of the U. S. Coast and Geodetic Survey, is responsible for the story. He reports that the Survey ship Lydonia, in command of Lieut. Comdr. R. P. Eyman, on returning to her working grounds off the New York coast recently, found one of her sono radio buoys nowhere in sight.

This buoy had been "planted" at a determined position, together with another similarly placed buoy, for use in fixing the positions of innumerable soundings made by the Lydonia in the course of her surveying operations far out of sigh of land. This is done by throwin TNT bombs overboard at interval to explode under water while th soundings are taken, the sono radi buoys broadcasting return signal by radio to the ship on receivin these sound impulses from th bombs. As the speed of sound i seawater is known, the distance the ship from the buoys is determined by the time interval betwee the firing of the bomb and the receipt of the radio signal aboard shi

Believe It or Not, the ship wa able to retrieve the buoy from thes signals, for each time a bomb wa thrown overboard from the Lydonia that lost sono radio buoy broadcas its distance away from the ship. I had drifted some 25 miles.

og Records From Maine Coast

The Pacific Coast has long been mous for summer sea fogs, but see hat they are doing in Maine, as scribed in the current issue of U. Lighthouse Service Bulletin:

"During the month of July, 1938, settled weather conditions along e coast of Maine resulted in unual amounts of fog, even for this gion where fog is of common ocrrence, some light stations soundg their fog signals for as much as o-thirds of the time. The longest ntinuous run of any station was at of 323 hours and 50 minutes, at tit Manan Lighthouse, in eastern aine. The greatest number of urs of operation during the month s 487 hours and 15 minutes, at ose Peak, Maine, a station long ked upon as being located at out the foggiest spot on the coast.

"While records of the past 5 years ow large amounts of fog on the ine coast, in no case did a fog nal operate for as much as 400 urs during any 1 month."

The table herewith shows the fog ports for July from Maine stans, showing unusual operation of horns.

Fourteen days' fog of a density ficient to demand continuous option of a fog signal is an unenble record in which Maine will e no ardent competition.

Station	Total hours during month	Longest continuous run
se Peak, Maine	487	261
it Manan, Maine	466	323
s Harbor Head, Maine	399	302
by Islands, Maine	482	274
le River, Maine	465	259
r Island, Maine	345	219
int Desert Rock, Maine	438	172
at Duck Island, Maine	429	169
inicus Rock, Maine	399	155
nt Coat Harbor, Maine	307	141
lleback Ledge, Maine	335	138
on Neck, Maine	344	135
te Head, Maine	332	129
Bush Island, Maine	320	129
h Island, Maine	391	109

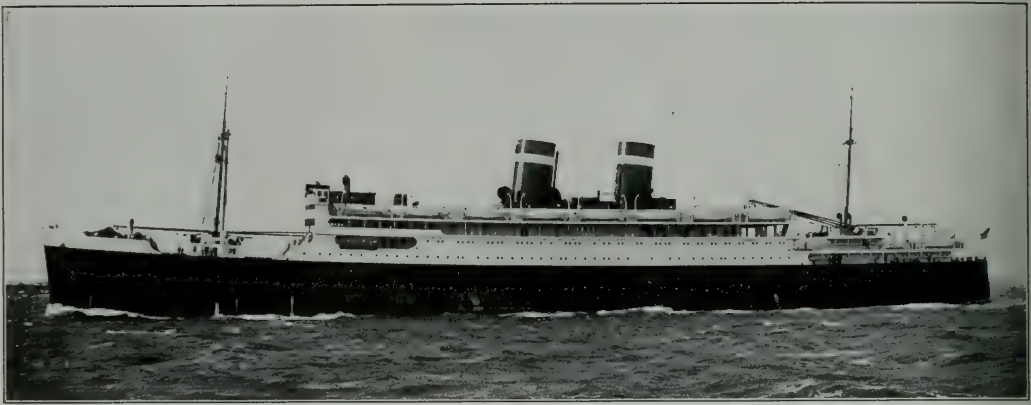
Deck Officers' Licenses

The following list shows licenses granted during the month of August to deck officers of the merchant marine at Pacific Coast offices of the Bureau of Marine Inspection and Navigation:

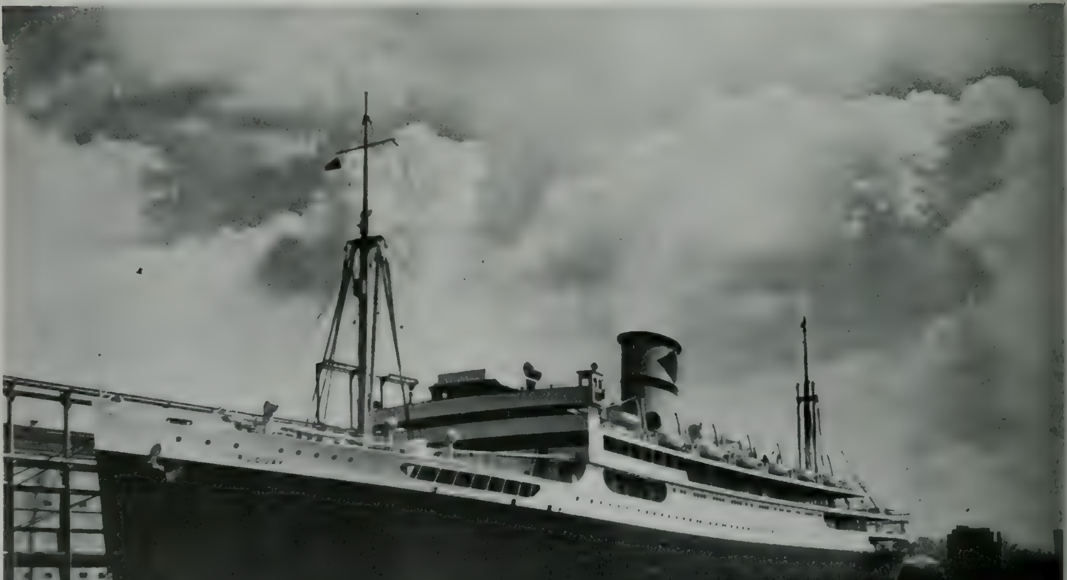
Name and Grade	Class	Condition
JUNEAU		
Anthony W. Nickerson, Master	OSS & OMS, any GT	
SEATTLE		
Alfred Thomsen, 2nd Mate	OSS, any GT	O
Andrew Abramenkoff, 3d Mate	OSS, any GT	O
Benjamin Edelheit, 3d Mate	OSS, any GT	O
Arthur K. Natland, 3d Mate	OSS, any GT	O
PORTLAND		
John H. Hubner, Master	OSS, any GT	RG
Larz D. Neilson, Master	OSS, any GT	RG
Donald J. Sass, Master	OSS, any GT	O
Warren E. Jarman, Chief Mate	OSS, any GT	RG
SAN PEDRO		
Tracy B. Sands, 2nd Mate	OSS, any GT	O
SAN FRANCISCO		
John F. Benak, Chief Mate	OSS, any GT	RG
Carter M. Houston, Chief Mate	OSS, any GT	RG
Robert A. Eastman, Chief Mate	OSS, any GT	RG
Maurice M. Baker, 2nd Mate	OSS, any GT	O
Arthur A. Andersen, 2nd Mate	OSS, any GT	RG
William J. Wagner, Jr., 2nd Mate	OSS, any GT	RG
George I. Andrews, 2nd Mate	OSS, any GT	RG
Bruce H. Anderson, 3d Mate	OSS, any GT	O
Irving J. Andersen, 3d Mate	OSS, any GT	O
William M. Aye, 3d Mate	OSS, any GT	O
John S. Bailey, Jr., 3d Mate	OSS, any GT	O
Harold N. Bergeron, 3d Mate	OSS, any GT	O
Erwin N. Cooper, 3d Mate	OSS, any GT	O
John Dreyer, 3d Mate	OSS, any GT	O
George W. French 3d Mate	OSS, any GT	O
Henry M. Glick, 3d Mate	OSS, any GT	O
Alvin Gregory, 3d Mate	OSS, any GT	O
Melvin H. Hendriksen, 3d Mate	OSS, any GT	O
Richard D. Heron, 3d Mate	OSS, any GT	O
Guy V. Horton, 3d Mate	OSS, any GT	O
Frank L. Johnson, 3d Mate	OSS, any GT	O
Paul F. Kusse, 3d Mate	OSS, any GT	O
Harry S. Littlefair, 3d Mate	OSS, any GT	O
Robert D. May, 3d Mate	OSS, any GT	O
Frederick H. Nichols, 3d Mate	OSS, any GT	O
Townsend A. Peck, 3d Mate	OSS, any GT	O
John A. Peterson, 3d Mate	OSS, any GT	O
Theodore W. Rice, 3d Mate	OSS, any GT	O
Louis Rossi, 3d Mate	OSS, any GT	O
Cyril W. Royston, 3d Mate	OSS, any GT	O
Robert B. Simpson, 3d Mate	OSS, any GT	O
John F. Summerill, 3d Mate	OSS, any GT	O
Chester H. Tubbs, 3d Mate	OSS, any GT	O
Melvin J. Uhl, 3d Mate	OSS, any GT	O
Robert W. Walton, 3d Mate	OSS, any GT	O
William S. Warnekros, 3d Mate	OSS, any GT	O
Alexis Witmer, 3d Mate	OSS, any GT	O

Abbreviations: GT is gross tonnage; RG is raised grade; O is original license; OSS is ocean steamer; OMS is ocean motorship.

BEFORE *and* AFTER



Pictured above is S. S. California of the Panama Pacific Lines as she appeared when running on intercoastal service. Below is the same vessel, now named Uruguay, as she appears after her recent face lifting operation. She is now serving on the American Republics Line South American service.



American Republics Line

'Good Neighbors Fleet" Begins De Luxe Passenger Liner Service Between New York and South American East Coast Ports

When the S.S. Brazil sails from w York harbor Saturday, Oc- ber 8, for Rio de Janeiro, Monte- leo, Santos and Buenos Aires, she ll inaugurate an American de xe steamship service between the nericas.

Three modern luxury liners, each re than 600 feet in length and h having a displacement of over 000 tons, will comprise the new ood Neighbor Fleet," which will operated by the United States ritime Commission under the me of the American Republics ne.

The steamships assigned to the w South American service are . Brazil, S.S. Argentina and S.S. uguay, formerly S.S. Virginia, . Pennsylvania and S.S. Califor- , operating in intercoastal service ween New York and San Fran- co. Approximately $1,000,000 has n spent recently to insure com- t and convenience to passengers veling to our southern neighbors ard these ships.

All three ships have up-to-date, dern, de luxe appointments, and equal in comfort, luxury and worthiness to any of the trans- ntic liners.

Each of the "Good Neighbor et" steamers accommodates 400 t and tourist class passengers, has an average speed of 18 ts. They are twin-screw and largest turbo-electric liners r built in the United States. y are provided with swimming ls and luxurious public rooms, erooms and suites. Passenger ommodations are especially pted to tropical weather condi- s and the dining rooms are com- ely air conditioned. Each ves- has general cargo space of 490,- cubic feet and refrigerated cargo space of 108,000 cubic feet.

For years existing steamship service between the east coasts of North and South America has been considered inadequate. Because of the development of closer international relations between the United States and the countries of South America, with a resulting expansion of trade and cultural ties, the United States Maritime Commission decided last spring that American flag service between these countries required immediate improvement.

Whereupon the Maritime Commission acquired the three liners from the Panama Pacific Line and immediately began the task of reconditioning them. The S.S. Brazil was reconditioned at a Newport News, Va., shipyard, and the S.S. Argentina and the S.S. Uruguay were overhauled at the Bethlehem Shipbuilding Corporation, Brooklyn, N. Y. The New York shipping firm of Moore & McCormack Co., Inc., will act as managing agents of the American Republics Line until January 1 for the account of the Maritime Commission. After that date the American Republics Line will be operated by Moore & McCormack under charter from the government.

In addition to this passenger and cargo express liner service, fortnightly fast freight sailings between Atlantic Coast ports of United States and east coast ports of South America began on September 29 with a fleet of six cargo ships of the American Republics Line operated by Moore-McCormack Lines, Inc.

Freight service between these ports in the past has been handled by 10-knot ships. The six ships of the American Republics Line service have a speed of 16 knots. Names of the steamships entering the new service are the Mor-Mac-Sea, sailing September 29; the Mor-Mac-Rio, sailing on October 13; the Mor-Mac-Sul, sailing October 27; the Mor-Mac-Rey, sailing November 10; the Mor-Mac-Star, sailing November 24; and the Mor-Mac-Mar, sailing on December 8. All are ships of from 8,300 to 8,700 gross tons.

United States ports which will be regularly served by the new service are Boston, New York, Philadelphia, Baltimore, Norfolk, Charleston, Savannah, and Jacksonville. Regular ports of call in South America will be Rio de Janeiro, Santos, Montevideo, Buenos Aires, and to the River Plate ports, Victoria, Bahia, Angra dos Rios and Pernambuco.

Calking Compound Cartridge

Lastik Products Co., Inc., have recently developed a special cartridge for loading "Lastikalk" calking compound into calking guns. The cartridge not only saves loading time but eliminates all waste, since the gun empties every drop from the cartridge.

An application of calking by this easy method prevents infiltration of dust, dirt and passage of rain, snow or moisture through, in or around window frames and doors. Fuel bills are reduced, drafts are prevented and the health and comfort of the occupants are better.

Inserting cartridges in the gun is an easy matter. Simply remove cellophane wrapping and the lids at each end of the cartridge. After removing nozzle of gun, pull back the plunger. Insert the cartridge with reverse cap to the rear. Replace nozzle and gun is ready to use.

Proposed *New Steamers* for Delta Line

By N. O. PEDRICK

President, Mississippi Shipping Company, Inc., New Orleans, La.

The United States Maritime Commission on September 16 issued a call for bids for the construction of 1, 2 or 3 combination passenger-cargo vessels for account of the Mississippi Shipping Company, Incorporated, of New Orleans, La. The call for bids marks the completion of months of preparatory work on the part of the Mississippi Shipping Company and their consulting naval architect, V. M. Friede of New Orleans. The ships are designed to operate in the regular trade of the company between New Orleans and other United States Gulf ports, and the principal ports on the East Coast of South America, i.e., Rio de Janeiro and Santos, Brazil, Montevideo, Uruguay and Buenos Aires, Argentina. Bids will be received from shipyards of the United States on November 1. Time for completion of the first vessel has been fixed at fifteen months from the time the building contract is executed; for the second ship, seventeen months from date of contract; and the third ship, twenty-seven months from date of contract. As it is anticipated that the contracts will be signed prior to December 1, 1938, the first vessel should be completed early in the spring of 1940. Immediately on completion and delivery the vessels will enter on regular service.

The vessels are to be built in accordance with the provisions of the Merchant Marine Act 1936 and amendments thereto. The construction of these vessels was provided for in the long-term operating differential subsidy contract between the United States Maritime Commission and the Mississippi Shipping Company, Inc. The vessels will be built to highest classification of the American Bureau of Shipping. The design and construction have been approved by the United States Navy Department as well as all other interested Government bureaus and agencies. The principal characteristics of each vessel are as follows:

Length overall	492′
Beam	65′ 6
Load draft	25′ 6
Total loaded displacement (approximately)	14,200 ton
Deadweight capacity (approximately)	8,900 ton
Gross tonnage (approximately)	8,300 ton
Sustained sea speed at load draft	16½ knot
Passenger accommodations	6

The general arrangement of th cargo and passenger spaces was arrived at after months of study, an represents the consensus of th company's staff and the naval architect. In order to provide for th handling of diversified cargoe there are seven cargo holds an fourteen tweendeck spaces. Thi will permit the very best possibl stowage, and eliminate any difficu ties which might arise through th handling of different kinds of carg one of which might be contaminated by the other. The seve hatches will be served by fourtee high-speed electric winches, an

Artist's conception of proposed vessel for the Delta Line service of the Mississippi Shipping Company, on which bids were invited for 3 shi by the U. S. Maritime Commission.

urteen steel cargo booms, which ll make it possible to load and dis- arge an entire cargo in the time otted for the turn-around of the ssel. In addition to the regular rgo booms, there will be provided jumbo boom capable of lifting 30 ns, which will make it possible to ndle heavy machinery, etc., for hich it is anticipated there will be good demand in the South Amer- an countries during the next sev- al years. In addition to the spaces ovided for stowage of ordinary rgo there will be two refrigerated mpartments with a total cubic ca- city of about 10,000 cubic feet. is refrigerated space is more than uble that now available on the ssels of the company, and it is ticipated that there will be no dif- fulty in filling this space with Ar- ntine fruit during the shipping ason for that commodity. It is ped that the movement of other asses of refrigerated cargo can be veloped.

The passenger accommodations unusually elaborate for a vessel this size and type, and are cal- lated to satisfy the requirements the most discriminating traveler. e general scheme of the passen- r accommodations will be along dernistic lines. The public rooms d promenade deck are ample— en spacious—and are provided th furniture conducive to the ut- st comfort. In fact, comfort and plicity may be said to be the key- tes of the general scheme of the ssenger accommodations, both of ich are in keeping with modern nds. The sixty-three passengers ll be accommodated in twenty- r outside staterooms, each uipped with private bath and with t and cold fresh water in all baths d showers. The veranda cafe, ich is located on the after end of promenade deck, will be fitted th a dance floor as well as neces- y chairs, tables and other appro- ate furniture. The ship's bar will located in the veranda cafe. On boat deck, just aft of the funnel, re will be an open-air swimming ol and appropriate facilities for bathing as well as sea bathing. e dining room is located in the ward end of the passenger ac- nmodations on the deck just be- the passenger cabins. It will be reached by a grand staircase leading down from the main entrance or foyer, and extends the full breadth of the ship. Seating accommodations are provided for a total of seventy-eight persons, which is well in excess of the total number of passengers and officers who will be served in the main dining saloon. The dining saloon will be completely and adequately air-conditioned. There will be adequate service facilities for the passengers, such as hospital, dispensary, barber shop, laundry and library. There will also be a complete assortment of shipboard amusement devices, such as piano, radio and deck games. Wireless sets of latest, most modern design will be provided so that communication can be maintained directly between the ship and her home port throughout the voyage.

No pains or expense are being spared to make these vessels the safest afloat. Fire-prevention, fire-detecting, and fire-extinguishing systems are designed in accordance with the very best and most modern practice. There will be practically no flammable material used in the construction of the vessels, and all stateroom furniture will be of metal. In the event that a fire should develop in the bedding or clothing of a passenger in any of the staterooms, it would not pass from one room to another, since all partitions between staterooms are of flame-proof construction. They will be two-compartment ships, which means that any two adjacent compartments may be flooded without danger of sinking the vessel.

The machinery of the vessels will be of the most modern and efficient design. The main propelling machinery will consist of cross compound steam turbines driving a single screw through double reduction gears. The steam will be supplied by three oil-fired boilers with a working pressure of 450 pounds per square inch and a total temperature of 750 deg. F. The boilers are designed so that any two of them can, in an emergency, supply sufficient steam to operate the vessel at her normal speed. Electric power will be used for the major portion of the auxiliary machinery as well as for practically all of the deck machinery. Even the ship's galley will be fitted with electric ranges and electric ovens. The electric power will be developed by three marine type generators, each having a rated output of 300 kilowatts. In normal operation, two of the generators will be ample to take care of all the requirements of the vessel, the third generator being provided as an extra safety precaution. In addition to the regular generators, there will be installed an emergency diesel-driven generator which will provide ample current for essential electrical requirements for emergency purposes only.

In keeping with the present trend towards providing better housing and accommodations for merchant seamen, the crew's quarters on the vessels will be spacious, well ventilated and equipped to insure maximum comfort. The deck and engine unlicensed personnel will be housed in staterooms in the after end of the ship. Petty officers will have individual staterooms, and in no case will there be more than three men to a room. Ample toilets and showers are provided, and all showers are fitted with the same fixtures as used in the passenger showers. Hot and cold fresh water is provided in all crew's wash basins and showers. There is provided a large recreation room equipped with tables, chairs, settees, library and radio. The steward personnel will be housed amidship. The crew's messrooms, which provide seating capacity for the entire crew, are also located amidship on the same deck as the galley. The crew's quarters throughout provide a minimum of 30 square feet of floor space per man, and in the majority of the rooms this area is considerably exceeded. The quarters throughout comply with the general recommendations of the Committee on Crew's Quarters which was created by the Maritime Commission in 1937, and which made general recommendations after a thorough and complete study of housing conditions in the American Merchant Marine.

The vessels will be operated on regular, fixed schedule, and upon completion of all three, will provide a sailing every twenty-one days.

The complete round voyage, from departure New Orleans until return, will require about forty-nine days.

Victor - Kimball - Krogh Pumps In Marine Service

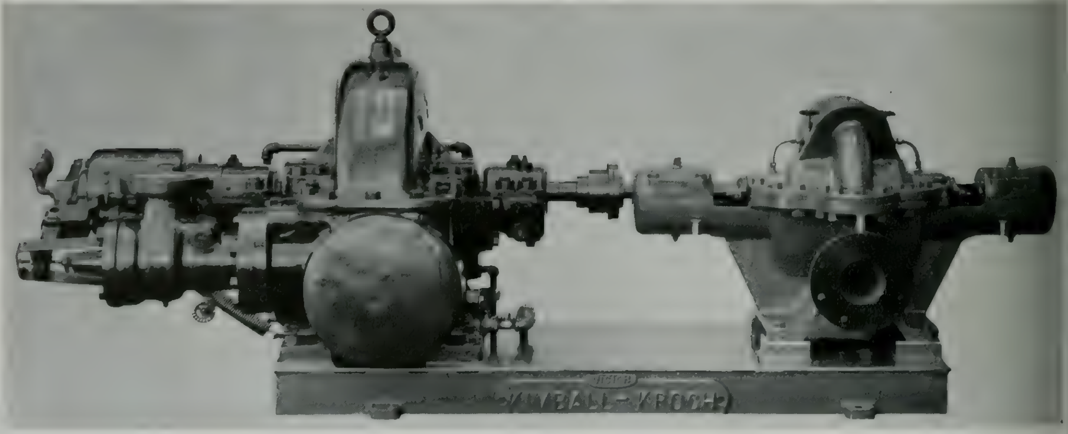
For over 70 years the Kimball-Krogh Pump Division of the Victor Equipment Company of San Francisco and Los Angeles has built pumps of dependable service for industrial, agricultural and special services of all kinds. During all of that time this pioneer Western pump manufacturer has kept abreast of and in many instances has initiated improvements in pump efficiencies and betterments in mechanical construction. On this foundation of long experience and much experimental research the Victor-Kimball-Krogh technical staff has built up a line of centrifugal, turbine, and propeller pumps that cover practically every service demanded in the transfer of liquid and semi-liquid materials.

Naturally this long, successful service record in the various fields of industry has attracted the attention of marine engineers and ship operators who are always on the watch for improved service in the auxiliary machinery aboard ship, and on a number of special installations V-K-K pumps are making good aboard ship.

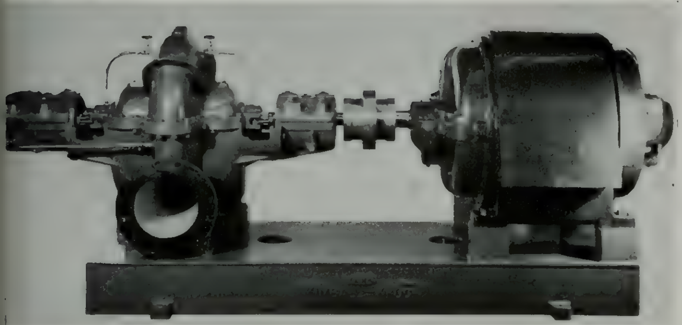
One notable and very special application is the installation of two slow speed, non-clogging V-K-K centrifugals on board the floating fish processing plant American Fisher. Each of these pumps is driven by a 60 horsepower electric motor. Purse seine fishing boats bringing their catches to the American Fisher are moored to booms and discharge their loads of sardines into large basket hoppers connected to the suction of these pumps. The pumps serve to transfer sea water and sardines from the sea level of the hoppers to screen conveyors above main deck level. The impellers of the pumps are designed to effect this transfer practically without damage to the fish and it has been demonstrated in service that this method is much superior and less costly than the older methods with various types of elevating conveyors.

Another and more recent application on shipboard is the installation for the U. S. Army Engineers on the sternwheel steam towboat Mississippi, serving out of New Orleans. This consisted of a 5 inch double suction marine general service centrifugal pump capable of delivering 700 gallons per minute against a total head of 370 feet when driven at 3300 r.p.m. The drive for this pump is a 100 H.P. Moore steam turbine mounted on a common base with the pump. The base is of welded steel plate. This unit as shown in the illustration herewith is a compact, shipshape assembly, yet with ample accessibility for inspection, adjustments, lubrication and repairs. Note that the casing of this type of V-K-K centrifugal pump is split horizontally above the bearings so that the cover may be easily removed for complete inspection without disturbing impeller, bearings, shaft, or piping connections.

An interesting new development



V-K-K 5" double suction centrifugal pump driven by 100 H. P. Moore turbine, as installed on sternwheel towboat Mississippi.



the V-K-K two stage motor ounted centrifugal known as type KE. This unit mounts the pump ipellers on the same shaft as the tor of the motor, thus forming a ry compact unit of high capacity, w weight and low first cost. The otors are ball bearing and the afts are designed with the proper mensions to eliminate vibration. e pump has a unit casing of spe- al design in Meehanite cast iron. is casing bolts directly to a ring ing on the end of the motor ame. On its outer-end it is fitted th a cover that is easily remov- le without disturbing either suc- n or discharge connections. Re- val of this cover gives complete cess to shaft nut and pump im- llers.

This pump is manufactured in a de range of capacities ranging in ndard sizes from 75 to 1000 gal- s per minute against heads from) to 800 feet. This range of heads d capacities covers a wide diver- y of applications aboard ship.

Another characteristic of this motor pump unit is its ability to pump efficiently no matter what its position or angle of installation. Bolted down on the deck; up on the deck beams; to the side of the ship or to a bulkhead at any angle it pumps away with the same vibrationless efficiency as if it were mounted on a concrete block in a power house ashore.

This feature enables the marine engineer to better adapt the installation position of the pump to the best layout for piping and is especially valuable on shipboard where pipes often come to any given point on very inconvenient angles.

V-K-K pumps are manufactured at Los Angeles in a modern plant equipped with the best and most modern machine tools. The Victor Equipment Company maintains a service and engineering representative at all principal ports on the Pacific Coast. In the coming revival of Pacific Coast shipbuilding this pioneer Pacific Coast pump builder will be actively in the market for marine applications of V-K-K pumps.

Bauer-Wach System Exhaust Turbines

(Continued from Page 38)

installations being in the range from 20 per cent to 25 per cent.

Where raising of power is the principal object, remarkable results have been obtained as, for instance, in five twin screw passenger vessels of the P. and O. Steam Navigation Co., which were powered with quadruple expansion engines. Three of these plants had a combined output of 10,000 shaft horsepower each, and these were raised to 13,000 S. H.P. each. Two had a total output of 14,000 each, and on these the installation of Bauer-Wach exhaust turbines raised the power to 17,500.

Two Norwegian steamers, the Bergensfiord and the Stavangerfiord, twin screw, triple expansion jobs, had their average speed increased respectively from 15.67 to 17.5 knots and from 15.8 to 17.5 knots with no alteration of boiler plant and no increase of total fuel consumed. The increase in power output was in these cases 34.3 per cent for the Bergensfiord and 41.5 per cent for the Stavangerfiord. The figures are taken from the engineer's log and from a comparison of averages for the year before and the year after the installation of the Bauer-Wach exhaust turbines.

Bauer-Wach system exhaust turbines are manufactured in America by the De Laval Steam Turbine Company.

Safety Observance In Terminal *Operations*

By BYRON O. PICKARD

Manager, Accident Prevention Bureau, Waterfront Employers' Association of the Pacific Coast

It is now nearly thirty years since the expression "safety first" was introduced to industry. The term was actually proposed and universally accepted as the slogan for the cause of accident prevention, which cause we of this generation have seen sweep the industrial world, the home, the streets, the highways, the schools and all other places and activities where injuries can and do happen to human beings. The slogan was soon so commonplace and so overworked that it became meaningless and now has gone the way of all slogans. But the cause for which it stood is still prospering and evidently it has aroused the interest of the Pacific Coast Port Authorities, else they would not have given it a place on the program at this annual convention.

I recall that in 1930, at the request of a program committee, a paper of mine was read before the American Association of Port Authorities in Milwaukee. Eight years have passed, and I am truly complimented on being invited again to address a Port Authority group. That paper was principally a review of the program, organization and accomplishments of the Accident Prevention Bureau of the Pacific Coast Marine Associations. There is no need to duplicate that effort as I believe that the Bureau, its work, and its accomplishments have been so widely advertised that your Association is acquainted with us and with the purpose for which we were organized.

We have gone through both good and hard times since 1930 and have seen ups and downs in our frequency ratings, but thanks to the stick-to-it-iveness of our stevedoring companies and shipowners, the Bureau is still alive and functioning.

Since the Strike of 1934 labor relations in the industry have been such that it has been most difficult to maintain the low frequencies attained in 1932 and 1933, but the year 1937 proved that in spite of disturbed industrial relations accident frequencies can be lowered. Probably there has never been a tougher time in the history of industrial accident prevention than that experienced in the years 1935, 36, 37, and even this year, and many of the problems have been foreign to those formerly experienced. But due to the thorough foundation which was laid in the earlier years of our program, coupled with the fact that our contributing members retained confidence in the cause, many of the problems have been licked.

However, I am not here to brag about our work. My sole purpose is to point out to the best of my ability what is being done and what further can be done on **terminals** in the interest of controlling conditions resulting in unexpected occurrences that are so commonly labeled "accidents."

The successful company programs for reducing accident frequencies always have been led by executives who were thinkers, planners and men of action. There is no reason why our Pacific Coast terminal executives should not be successful in devising plans for controlling conditions resulting in accidents and in putting these plans into action. Certainly they have proved their ability by constructing some of the finest and most efficient terminals in the world. When these terminals were designed the efficiency of operations had first consideration, and it was well known to the designers tha prevention of failures in materials was a component part of efficiency it was accepted without question that the design of terminals and their layout were important accident prevention items. The Pacific Coast terminals vary in design and in layout, but few can be criticized for not being efficient for the purpose for which they were constructed. This applies more especially to our recently constructed terminals. However, many of the older terminals are above criticism.

When this subject was assigned each of the District Engineers working for the Accident Prevention Bureau was requested to make a survey of safety observances on the various terminals in his district. Reports were received from Puget Sound, Columbia River, Los Angeles Harbor, Oakland, Alameda an San Francisco. A review of the five different reports received justifies the conclusion that, with but a few exceptions, the majority of our Pacific Coast terminals have no definite accident prevention program either for operating the terminal o for maintenance.

• Definite Program Needed

Possibly it has not been generally recognized by the terminal managements that preventing the uncontrolled and unexpected occurrence not only pays dividends but reduce capital outlay, cost of operation an cost of maintenance. It may be tha on account of the time required t take care of the business end, ou terminal executives have not ha time to realize that an accident pre tion program should be a definite t of the operations and that in th final analysis accident preven- ti does not have any cost; it is th unprevented accidental occur- rece that costs money.

hat do accidents cost terminal rators? This question cannot be n a definite answer, but I have idea that accidental occurrences costing much more than is gen- ly believed. If I should state in ars and cents what I believe are costing, you would put me n as either misinformed or y. According to the California Compensation Manual rates lished by the State of California, terminal operators, as a group, e construction and maintenance loyees whose premium rates run igh as $25.00 per $100.00 of pay- , and others whose premium s are between that rate and 0. Clerks, checkers and office kers have rates comparable to r industries.

vidently those terminal employ- who are compelled to insure r injury risks are paying plenty insurance protection, but the of insurance is only a small part he actual outlay for unexpected urrences. There are other losses as wastage of time, of material, of property for which there is insurance protection. These hid- losses frequently amount to four ive times the cost of injury pro- ion.

he 1938 California Manual gives mpensation insurance rate for shoremen employed on termin- of $5.46. It is my understanding all cargo handlers on the Cali- ia terminals are assessed at the e base rate. I am not informed the State rates charged on the gon and Washington terminals. to the accomplisments of or- ized accident prevention by edoring employers, cargo han- s on California terminals have their compensation insurance nium rate reduced nearly 50 per from what it was in the earlier s of our program. Terminal op- ors have profited by this of se, but it should be easily re- d another 50 per cent if all ls join in supporting the effort.

he accident prevention problem for terminals resolves itself into two natural divisions, viz., the controlling of the conditions that result in injuries to employees of companies authorized to work on terminal properties and the controlling of the conditions that cause injuries to the employees of the terminal company itself.

The States of California, Oregon and Washington, through their State Industrial Commissions, have promulgated certain safety orders for methods of doing work and for physical conditions of working places. Many of these safety orders apply to terminal operations and physical conditions. It is not too evident, however, that all of our Pacific Coast terminals are strictly complying with all of the safety rules that are so common to other industries. To control the conditions resulting in injuries to employees of companies authorized to work on terminal properties, such as steamship companies, stevedoring companies, trucking companies, railroads, etc., the problem so far as the terminal operators are concerned resolves itself to the **provision and maintenance of safe places of work.**

● Safe Places of Work

The term "safe working places" is another of those indefinite safety terms that are overworked. In order to be specific I offer the following as the most important provisions if a reasonably accident-free working place is the desire of the management.

1. Orderly and clean places of work.
2. Freedom from objects causing tripping and stumbling.
3. Freedom from slipperiness.
4. Freedom from confusion caused by lack of control of traffic and lack of traffic regulations.
5. Control of speed of public conveyances.
6. Regulations for piling material and thereby providing for safe piles, for spaces between piles and for breaking down of piles.
7. Standardized lighting of piers, aprons, bulkheads and yards for night as well as for day operations.
8. Guarding of all exposed moving parts of mechanical devices.
9. Guarding of all exposed pier openings.
10. Standardized and well maintained ladders.
11. Standardized and well maintained doors.
12. Standardized and well maintained stringer guards on aprons and at other places on terminals that are exposed to the water.
13. Well paved surfaces kept free from holes and roughness.
14. Fire protective devices.
15. Fire fighting devices.
16. First aid dressing stations.
17. Telephones.
18. Sanitary toilets.
19. Sanitary drinking fountains.
20. Life saving devices.

● Safety—A State of Mind

One of the reasons why a definite organization for accident prevention has been so hard to get over to certain managers and why their wholehearted support has been withheld is the idealism which is so frequently used in selling the program. The term "safety," for example, is difficult to comprehend when one takes into consideration the general carelessness of human beings and their inborn contempt of sissiness. It does seem ridiculous to go to the extremes in providing reasonably safe working places and safe working conditions when employees will make no attempt to take care of themselves while doing dangerous work. But there has now come to the realization of the safety engineer that "safety" is not a physical condition—it is not an ideal, but it is actually a **state of mind**. It is a "state of mind" of the man who exposes himself to work hazards as well as a "state of mind" of management. This state of mind in the employee can only be attained where working conditions are made reasonably accident - free, where practices are standardized and reasonable, and where equipment is standard and reasonably protected against exposure to moving parts.

There is no such thing as an accident-free working condition, but there is such a thing as a working condition that is **reasonably** accident-free when employees are safety-minded.

So let us take the idealism and the "bunk" out of this term "safety" and reduce it to a practical sense;

(Page 56, please)

GLASS TEXTILES

A New Fireproof Product Especially Adapted For Many Uses Aboard Ship

Glass marbles are made into thread (left), which in turn is woven into filter cloth (center) and tape (right).

The recent dedication of the new Fiberglas research laboratory of the Owens-Illinois Glass Company at Newark, Ohio, and the extended use of this compartively new product in many industrial applications ashore and afloat is directing serious attention to the great possibilities of a wide extension of these applications into: the decorative, comfort and safety fields in passenger and crew accommodations; the field of electrical and heat insulation; and the field of joint seals for machinery and for piping systems.

Already the Owens-Illinois Glass Company technicans are ready to supply fireproof and waterproof wall covering made of lustrous Fiberglas cloth in beautiful colors and patterns. It is only a step from this to fireproof and waterproof draperies, tablecloths, napkins, bed linen, blankets, quilts, rugs, and carpets, making possible the completely fireproof ships that are the present ideal of American ship design.

This glass product and the method of its manufacture were discovered by the Owens-Illinois Glass Company in 1932. By 1934 their technicans had developed machinery for its manufacture and secured patents thereon. Glass in filament form had previously been manufactured in Europe but in much coarser filamentation. The new process produced fluffed filament glass for insulation that weighed about one pound per cubic foot as compared to six pounds per cubic foot as then produced in Europe.

Fiberglas is made in two ways at the Owens-Illinois plant. One is the "continuous filament" process; the other is the "staple fiber" process. In both of these methods glass "marbles" are melted in an electrical furnace. At the bottom of the furnace is a V shaped bushing having 102 tiny holes.

In the "continuous process" molten glass is forced by gravity through these holes. The filaments average .00025 of an inch in diameter. They can be made .00005 of an inch in diameter. The 102 filaments are combined to make one thread .024 of an inch in diameter and wound on spools.

In the "staple fiber" process the molten glass is blown through the holes by steam under high pressure. Passing through a burst of glass flame to eliminate moisture, the fibers gather upon and are drawn from a revolving drum. White as snow, the accumulation, or "silver," follows grooved wheels to be wound on swiftly revolving spools. These are taken to ordinary textile spinning machines for twisting and reduction to thread for fabrication

The principal present uses of t material in industry are as heat sulation, as electrical insulation, a as filtering material.

● Heat Insulation

Glass has been used in the for of woven mats and of fluffed aments as insulation for boile evaporators, steam piping, turbin and other heat applications, as w as for refrigerating machinery a chambers, on European vessels a quarter of a century. Fiberg is now being used for these purpo because of its ability to give hi insulation qualities with great s ings in weight, a feature especia valuable at sea where every pou of deadweight saved is a pou added to pay load.

● Electric Insulation

One of the great aims of electi research has been an inorganic stance of high insulating value, able of withstanding high temp atures and of being applied in v thin layers.

iberglas offers a practical com- ation of these ideal qualities. It wholly inorganic material. It no absorption of moisture. It ot affected by chemicals over an nded period of time. It can be lied in such thinness that its use enable the designer and builder electro-dynamic machinery to tly condense the volume of mo- or generators of a given ca- ty.

wens-Illinois is now experi- ting in the manufacture of glass ile materials with special glass position which will lend the ul- te in electrical characteristics ermanence to the insulation. It long been recognized that glass n exceptionally good insulator. as also been found that by vary- the glass composition these in- tion properties can be enhanced y times over the ordinary type lass.

is the intention of Owens-Illi- to offer Fiberglas yarn similar onstruction to the cotton, silk ayon yarns now being used by electrical industry, and to sup- a range of yarns from 150 yards pound to 140,000 yards per d. This is equivalent to yarns h are heavier than a No. 1 cot- yarn to those as fine as a No.

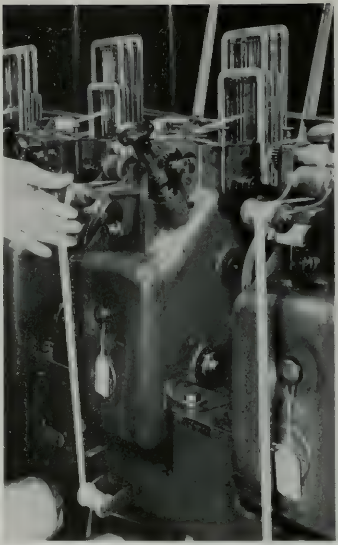
sulating tape woven from these s will be available in thick- es from .005″ to .035″, and in hs from ¼″ to 6″.

● lter Cloths

erglas offers a wholly inor- material, which is not affected ny of the acid conditions en- tered or affected by any of the eratures used in ordinary fil- n work.

erglas cloths are now being oped by the Owens-Illinois Company that will have as a filtering efficiency as any of naterials now in use, and will stand temperatures of 600°F. 0°F. and can be used in con- ated solutions of all acids ex- hydrofluoric.

ese cloths are strong and dur- and can be applied and handled st the same way as ordinary ials. In addition, they do not when wet and their filtration cteristics remain the same over ded periods of time. In some instances where cloths have been tested it has been found that they will give a 60-day life, as compared to a 10-day life on wool, or a 10-hour life on paper filtration medium.



Fiberglas filaments being woven into tape of various widths.

In process work such as ore smelting, removal of flue gas and many other applications, it is often necessary to filter at temperatures up to 500°F. gases which are quite acidic in nature. Fiberglas cloth, because it can be woven tightly enough to be suitable for the removal of fine particles, and because it will stand acid and temperatures much better than any of the materials previously used, is of outstanding benefit to this field.

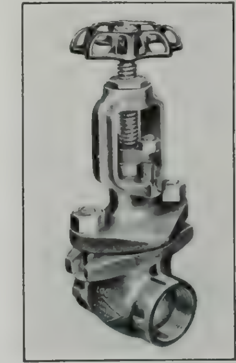
Such cloth made up in filter bags will enable manufacturers to use dust removal systems directly on the hot gas, without the necessity of cooling through air washers or long runs of pipe. Fiberglas thread can be used to sew the bags, making them a completely inorganic, permanent material.

● Gaskets

Fiberglas cloth as a base material in the construction of oil field gaskets and other such items now looms as a product of superior performance.

Corrosion Resisting Valves

Jenkins Bros. introduces to industry an advanced line of corrosion-resisting stainless steel valves. By "Corrosion-Resisting Stainless Steel" is generally meant some combination of chromium and nickel with small additions of silicon, molybdenum, copper, columbium, titanium, etc., the balance being iron. The expression "18-8," for example, refers to an 18 per cent chromium and 8 per cent nickel content.



These new Jenkins Valves are regularly made of Cooper 18-8 S and Cooper 18-8 SMO, each having a carbon content limited to a maximum of 1/10 of one per cent. Both are highly resistant to corrosion, but Cooper 18-8 SMO is used under most severe conditions and is particularly adapted to sulphite pulp mills. It is safe to state that these two alloys will take care of almost 90 per cent of all corrosion-resisting requirements. In cases where neither of these valves can be recommended, valves of other alloys will be considered on special order.

They are available in 7 different styles: solid wedge or double disk Gate Valves, union bonnet or bolted bonnet Regrinding Globe or Angle Valves, and bolted bonnet "Y" Valve; all either screwed or flanged, in sizes ½″ to 3″.

On the Ways—

SHIPS IN THE MAKING

LATEST NEWS FROM AMERICAN SHIPYARDS

Seagoing Merchant Ships Building in American Yards

As of September 1, 1938, five American shipbuilding firms had under construction or contract forty-six seagoing steel merchant vessels with a total measurement of approximately 430,000 gross tons. These ships are divided among the five firms as follows:

Bethlehem Shipbuilding Corp. Ltd.

3 large, fast tankers; Standard Oil Company of New Jersey and U. S. Maritime Commission.
1 tanker; Texas Oil Company.
1 tanker; Union Oil Company.
2 tankers; Socony-Vacuum.
3 passenger and cargo vessels; Panama Railroad Company.
4 cargo vessels; Export S. S. Co.
Total, 14 vessels; 135,000 gross tons.

Federal Shipbuilding & Dry Dock Co.

3 large, fast tankers; Standard Oil Co. of N. J.—U. S. Maritime Commission.
6 C-2 cargo carriers; U. S. Maritime Commission.
Total, 9 vessels; 76,650 gross tons.

Newport News Shipbuilding and Dry Dock Co.

1 passenger and cargo liner; U. S. Lines.
3 large, fast tankers; Standard Oil Company of N. J.—U. S. Maritime Commission.
4 cargo vessels; U. S. Maritime Commission.

Sun Shipbuilding & Dry Dock Co.

3 large, fast tankers; Standard Oil Company of N. J.—U. S. Maritime Commission.
2 large turbo-electric tankers; Atlantic Refining Co.
6 cargo vessels; U. S. Maritime Commission.
Total, 11 vessels; 94,000 gross tons.

Tampa Shipbuilding and Engineering Co.

4 cargo motorships; U. S. Maritime Commission.
Total gross tonnage, 36,880.

This 430,000 gross tons of shipping is a respectable total considerably above American normal totals in seagoing tonnage. However, it is not nearly high enough to compensate for the many very lean years just past nor to rebuild our overseas merchant fleet into modern sea transport units.

As described in these columns, this total will shortly be augmented by some 20 vessels, construction of which is covered by subsidy contracts or by direct replacement program of the Maritime Commission. It is hoped that the building of these 20 ships will cover a wider geographical range of American shipyards.

At least half of them should be built in Pacific Coast yards.

Bids Called For C-3 Vessels

Much interest is aroused on the Pacific Coast over the possible construction of ships of the Standar C-3 design by the U. S. Maritim Commission. Invitations for bids were issued on September 6. Severa Pacific Coast yards are actively figuring on these bids, including Moor Dry Dock Company, Union Plant o Bethlehem Shipbuilding Corp., Ltd. and Los Angeles Shipbuilding an Dry Dock Company.

As many as 12 ships may be constructed, but the exact number wil depend in large measure upon th prices submitted by the contractors If prices are in line with the Commission's estimates of costs it i hoped to build the maximum.

These ships, which will incorporate the most modern principles o cargo vessel construction, are noteworthy for their speed of sixtee and one-half knots and for the excellence of crews' quarters which among other advantages, will b light and airy and supplied wit running hot and cold fresh water.

An unusually large cargo spac for this type of ship has also bee laid out, running to a bale cubic capacity of 623,500 feet. They wil carry about 7,848 tons of dry carg and 2,070 tons of liquid.

They will have a deadweight tonnage of approximately 11,926; length of 492 feet overall; beam o 69 feet, six inches; depth of 42 fee six inches; and draft of 28 feet, si inches.

Propulsion will be by a singl

Read how Shell helped the S. S. Anna Schafer's *chief engineer end tail shaft sleeve wear caused by sand and grit*

For years, Chief Engineer John J. McGee knew what to expect when he had the tail shaft drawn on the S. S. *Anna Schafer*.

There would be sure to be deep grooves in the tail shaft sleeve. The bearings, badly scored by sand, would show excessive wear.

Then Mr. McGee heard about Shell's new method of packing stern tubes with water-resistant grease. He called in the local Shell man to explain it, and ordered it installed. Now, two years later, writes Mr. McGee:

"Cutting of tail shaft sleeve has been done away with. Gland packing trouble has been overcome. With this solid packing of grease in the tube, it is impossible for water or foreign matter to enter the stern tube."

As the saying went at dry dock time—the *Anna* docked with a surprise up her "sleeve."

More and more engineers, on large ships and small, are changing over to Shell's revolutionary method of stern tube lubrication . . . and saving their owners thousands of dollars on replacement costs.

A Shell marine engineer will give you full details. Phone nearest Shell office or write: Industrial Lubricants Division, Shell Building, San Francisco.

SHELL MARINE LUBRICANTS

screw driven by a geared turbine of the latest design with steam supplied by oil-burning water-tube boilers.

Bids, which will be opened at noon October 18, 1938, will be considered for one to six vessels from the same contractor, but no single yard may receive a construction award for more than six vessels.

The new ships will be of the shelter-deck type, built of steel, with raked stem and a cruiser stern, two complete steel decks, i. e., shelter deck and second deck, and a third steel deck fitted below the second and extending from the stem to the forward bulkhead of the engine and boiler room and from the after bulkhead of the engine and boiler room to the aft end of No. 4 hold.

The vessel will be subdivided by seven water-tight bulkheads into five cargo holds, forward peak tanks, after peak tanks, and machinery space. Crew quarters are provided in a house above the shelter deck. Deck and engine room force and the steward's department are berthed on the shelter deck in rooms containing no more than four persons each. Mess rooms for each department of the crew, also galley, refrigerator, ship stores, dry stores, laundry and deck log rooms are on the shelter deck. Cooking equipment and other conveniences in the galley will be electric.

On the cabin deck quarters will be provided for part of the engineer and deck force, two cadets, hospital, mess rooms, toilet accommodations and emergency generator and battery rooms, linen lockers and two spare staterooms having berthing arrangements for two persons each. Accommodations are provided on the boat deck for the captain, captain's office, chief engineer, chief engineer's office, chief officer, first assistant engineer and radio operator. There will also be a radio room, gyro room, and fan room on this deck.

Running hot and cold fresh water will be supplied to the basins in crew's and officers' rooms and to showers and lavatories in crew's, officers, and spare room toilets.

A refrigerating system will be provided for cooling the ship's refrigerated stores. The ship will be equipped with sixteen electric cargo winches. Hydro - electric steering gear of an approved design with telemotor control from the wheel house and at the after steering station will be installed. Complete lifesaving and other equipment, as required by the Bureau of Marine Inspection and Navigation, will be provided, and all bulkheading, ceilings and linings in the houses will be constructed of incombustible material.

Bids Invited for Delta Line Ships

The United States Maritime Commission on September 16 issued invitations for bids on three combination cargo passenger ships for the Mississippi Shipping Company service to the East Coast of South America. Specifications call for a ship 490 feet long with a 65 foot beam and a speed of 16½ knots. Each will have accommodations for 63 passengers.

Bids will be opened at the offices of the Maritime Commission at noon on November 1. A complete description and picture of the type of ship proposed will be found in the article beginning on page 44 of this issue.

Pacific Spruce Sold

The United States Maritime Commission announced September 16 acceptance of the bid of the Thompson Salmon Company of Astoria, Oregon, for the S.S. Pacific Spruce at $55,000, and the Donegan Lumber Company's (New Orleans) bid for the hull of the S.S. Lake Fairlie at $3,800. All bids on the S.S. Pacific Redwood were rejected.

Contract for Edgewater Conversion

The United States Maritime Commission on September 9 awarded the contract for conversion of the S.S. Edgemoor into a training ship for the United States Maritime Service to the Bethlehem Shipbuilding Corporation for $1,098,000. This bid includes installation of evaporating equipment at $165,000.

The Atlantic Basin Iron Works, Brooklyn, New York, had bid $1,129,000, including $168,000 for evap-

CRAIG SHIPBUILDING COMPANY
LONG BEACH, CALIFORNIA

Builders and Repairers of Steel and Wooden Ships

**Drydock Capacity
2500 Tons**

HULL AND ENGINE
REPAIRS

✓ ✓ ✓

FULLY EQUIPPED
FOR
Diesel Engine Work

DRYDOCK — 12,000 TONS CAPACITY

LOS ANGELES SHIPBUILDING & DRYDOCK CORPORATION
SAN PEDRO, CALIFORNIA - - *Cable*: LASHIPCO

rating equipment; and the New-ort News Shipbuilding and Dry ock Co. had bid $1,172,000.

The Edgemoor, which is now in ew Orleans, will be completely itfitted as a first-class training ship r 210 trainees and a crew of 55.

King-Knight Active

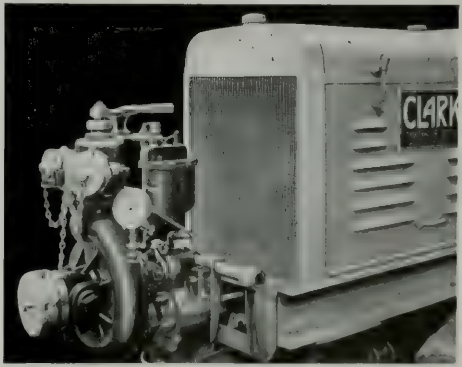
King-Knight Company of San rancisco report considerable activity the marine field. Two recent in-allations are notable.

The first of these was the purchase one of the major California oil ompanies of three diesel generating ts for use in development work in reign oil fields. This is a duplicate der on diesel generating sets pre-ously sold to the same company. he original sets have been in serv-e for over seven years, and judg-g from this repeat order they must ve been operating with marked suc-ss.

The second major item in recent ing-Knight marine installations is e sale of the Kinney Rotary main rgo pumps and stripping pump for e new tanker Associated of the de Water Associated Oil Company. is tanker is an outstanding success all departments, and the Associated erating department has expressed mplete satisfaction with the Kinney rgo pumps.

A Kinney Heliquad cargo pump as recently installed on one of the n Francisco Bay oil barges of the C. Freese Co. This is the third nney pump installation for this me service.

A New Tractor Pumper



Auxiliary fire protection for factories, wharves, warehouses and docks is afforded by a new special duty fire pump factory installed as part of the "Clarktor-6" industrial tractor. The centrifugal type pump, meeting all test requirements of the National Board of Fire Underwriters, can handle any kind of water, regardless of dirt, and is therefore effective not only when drawing from hydrants but also when the source of supply is a pond, creek, cistern or reservoir.

In practice, the very high pressure small nozzle supplied creates a fine mist at the end of the stream of water, thus quenching the blaze.

A floating, flexible drive between motor and pump is provided by a patented power take-off. Automatic primer primes the pump and keeps it primed by means of a vacuum from the motor intake manifold. When taking supply through a 4″ suction opening from a 30-lb. hydrant, the pump will deliver 400 gal. per min. at 120 lbs. pressure, with the motor running 1800 r.p.m., which is its normal controlled speed when operating the tractor. Pump capacity and speed may be increased by adjusting motor governor. The tractor power plant consists of a 46 H.P., 6-cylinder engine, equipped with air cleaner and renewable cartridge type oil filter.

The pump is installed on the front end of any "Clarktor-6" Tructractor, behind the bumper plate. This makes it easily accessible for servicing. When used as a pumper, the machine's bumper plate is lifted up out of the way and rests over the engine hood. When used as a pushing and pulling tractor, bumper plate rests in regular position and the pump installation in no way interferes with the normal tractor service. The manufacturers, Clark Tructractor, Battle Creek, Mich., point out that in addition to emergency fire protection, the outfit will be found useful in flushing out large areas of concrete driveways, floors or docks, for sprinkling roadways, filling and draining tanks.

SAFETY ON SHIPBOARD

A Section Devoted to the Creation of Safety Consciousness and Accident Prevention

Safety In Terminal Operations

(Continued from Page 49)

namely, the creation of such a state of mind that operations will be carried on as efficiently as is reasonable and without the frequent occurrence of unexpected events. Safety-mindedness is always predicated on orderly progress and orderly progress is only attained through a well planned program which is carried out to a logical conclusion. Accidents are of infrequent occurrence on jobs where the work is carried out under the jurisdiction of men who are safety-minded and are working to a well arranged schedule or program. There are work dangers (hazards) on every job that cannot be reasonably controlled, most of them so common that they may be treated with contempt by both supervisors and men, but recognition of the dangers is mandatory. Men who so refuse have no right to expose themselves to the job or the supervisors to be bosses.

Isn't that a logical statement? Doesn't every employer have the right to expect that those, in whom he has placed managerial powers, shall create and maintain a state of safety-mindedness?

In any special program designed to prevent accidents to workmen employed exclusively by the terminal, the provisions for safe practices and the training of employees in the accident-free way of doing things (taking no chances) must be included. The expression "take no chances" is a term which everyone understands and means exactly what it says—that men shall not expose themselves unnecessarily to those work hazards that cannot be eliminated. To reduce exposure for certain dangers that cannot be eliminated, safe clothing such as gloves, goggles, belts, and hard-toed shoes, has been developed and is largely used in industry. Guards, lights, non-slip materials, are used for other hazards. But even with all these provisions men must be taught the right ways of doing the job and be disciplined for infractions.

Programs Based on Experience

Every successful accident prevention program is based on facts gained from the experience of the employer. To get the facts, accidental occurrences must be reported and thoroughly investigated. The lessons learned are the facts that form the basis of the program. Further, there must be some executive definitely assigned to the administration of the adopted program. There are only a few of our terminals that are large enough to warrant a full time accident prevention superintendent. However, someone in the organization should be delegated with the authority to administer the definitely adopted accident prevention program.

It has been learned by experience that each person having supervising authority also should be made safety-minded and instructed to make accident prevention a very definite part of his supervision.

It was previously pointed out that every employer should be deeply concerned over the rising costs of employees' compensation; because on every side we are now being confronted with proposed legislation reducing the waiting period, increasing the weekly payments, and increasing the benefits. If we have no accidents resulting in injuries, the compensation costs will be soon reduced. Furthermore, if we pay close attention to our programs for safety-mindedness we would not be obliged to spend so much time combating rising compensation costs in the legislative and the insurance offices.

It is recognized that there is more incentive for a privately owned terminal, operated on a relatively small scale and for profit to its owners, to make every provision for accident prevention, not only for its customers but for its own employees, than there is for the larger publicly owned terminals that are operated and maintained for the convenience of the shipping public.

Further, that many of them were not planned for the present types of ships and mechanized stevedoring operations. To change them and bring them up to present prescribed minimum standards, would entail a considerable outlay of money, which money, as I am frequently informed by terminal engineering departments, could be used to a greater advantage in the construction of new terminals. To one interested and specializing in the prevention of accidental occurrences brought about by substandard physical conditions, this seems like a weak excuse. It is believed that such an excuse can be attributed to lack of either incentive or of knowledge of the benefits which will accrue from approved physical conditions, not only in reduced cost of maintenance, but in providing facilities for users.

Pacific Coast Terminal Conditions

Our survey revealed that while there is no definite plan for the prevention of accidents on the large majority of Pacific Coast terminals, there is a small group of terminal operators that have given considerable attention to the subject and cooperate whole-heartedly in correcting any substandard physical condition that might result in accidents causing injuries to longshoremen or other steamship employees, as well

Dependable Insurance Since 1863

Fire · Automobile · Marine · Casualty · Fidelity · Surety

FIREMAN'S FUND GROUP

Fireman's Fund Insurance Company — Occidental Insurance Company
Home Fire & Marine Insurance Company
Fireman's Fund Indemnity Company — Occidental Indemnity Company

Strength Permanence Stability

New York · Chicago · SAN FRANCISCO · Boston · Atlanta

to their own employees.

In order that other terminals may ofit by the experience of this oup, I offer the following as repsentative of the provisions that ve been reported:—

Particular attention is paid to constion; to the type of jitneys; types gear; to the physical conditions of e dock and to the piling of comodities. High piles are bulkheaded d supported in order to insure stality. Traffic and traveling lanes are arked off and kept free from obructions.

First-aid kits and trained first-aid tendants are provided to administer first-aid to anyone injured on e terminal.

The Stokes Navy type of stretcher provided for transporting injured en and can be used by the ships d stevedoring companies if necesry.

Speed limits are set for commeral vehicles and for jitneys and are gidly enforced.

Sanitary drinking fountains and ilets are provided and periodical spections made to insure sanitary nditions.

Housekeeping on the terminals is tched closely and sweepers proded to keep places clean. Oil and her slippery substances are clean- up immediately.

Provisions of the Terminal Safety de, which the Accident Preven- n Bureau developed in 1932 and fered to Pacific Coast terminals r voluntary adoption, are followed ry closely.

Stringer guards of standard size d with rings for fastening savels are provided. Life preservers and ladders have been installed to aid anyone falling into the water.

Arrangements for proper ambulance service for injured men are provided.

Minimum lighting standards have been installed and maintained.

Supervisors are instructed in the necessity of accident prevention and given enforcement authority.

Practically every terminal on the Pacific Coast is well equipped with fire-fighting devices, although few have developed or are enforcing a program for fire prevention.

There is need for a definite and specific program for preventing accidental occurrences during terminal operations. This program should not be haphazard. It should be well thought out and be fundamentally sound. To develop such a program will require a complete survey by men who are not only familiar with terminal operation and maintenance problems but who are safety-minded.

There is need for minimum safety standards for all gear and equipment, for lighting conditions, and for all other physical conditions on terminals; for practices and methods used in handling cargo and other commodities, and for such other activities as are common to terminals.

It has become almost universally recognized that accident prevention is destined to be the most important factor in industrial relations, because accidents are symptoms of unfit personnel, poor training, poor supervision and lack of planning. Through the application of safety training, approved practices, approved working conditions and safety-mindedness are developed. As a consequence, workmen are kept free from injury, free from interruptions and distractions and bosses and employees more willingly perform their functions with a minimum of mental and physical wear and tear.

SEA SAFETY EQUIPMENT FOR AVIATORS

In his recent record-breaking flight, Howard Hughes carried a number of ingenious safety devices. These were designed to protect both his plane and his crew.

A good deal of publicity was given to the fact that the record-breaking Lockheed was equipped with Kidde flotation bags. These are not, as most people imagine, a recent development, but have been used for years by the U. S. Navy and Army. Four of these bags were carried by the round-the-world plane, sufficient to keep it afloat if forced to land on the water. Each flotation bag is fitted with a small carbon dioxide cylinder, which can inflate the bag with this highly buoyant gas in a few seconds.

Howard Hughes also carried two four-man collapsible life rafts,

Marine Insurance in All Phases — "All Risks" . . . Inland Marine . . . Ocean Marine

STANDARD MARINE INSURANCE COMPANY, LIMITED
NATIONAL UNION FIRE INSURANCE COMPANY
MERCANTILE INSURANCE COMPANY OF AMERICA

GEO. E. BILLINGS CO.

Pacific Coast General Agents—Richard J. Lutich, Marine Manager

GArfield 3646
308 California St.
SAN FRANCISCO

TRinity 1521
Spreckels Bldg.
LOS ANGELES

SEneca 1478
Colman Bldg.
SEATTLE

MARINE DEPARTMENT
AETNA INSURANCE CO.
QUEEN INSURANCE CO.
MARITIME INSURANCE CO., LTD.
FIDELITY PHENIX FIRE INS. CO.
Commercial Hull Dept.
AUTOMOBILE INS. CO.

MATHEWS & LIVINGSTON
Marine Underwriters
200 BUSH ST. SAN FRANCISCO
Offices at: Colman Bldg. - Seattle 111 West 7th St. - Los Angeles

equipped with Kidde carbon dioxide inflation cylinders. These rafts are similar in operation to the flotation bags. A small cylinder containing compressed carbon dioxide is the means by which the raft is inflated. In the event that Mr. Hughes and his crew were forced to abandon ship while resting on the water it would merely have been necessary for them to turn a small hand wheel on the cylinder and the raft could be inflated in a few seconds.

It seems unbelievable that these rafts, which are about the size of a knapsack when deflated, can become highly efficient rowboats, 9 feet long by 5 feet wide. The answer is found in the fact that carbon dioxide gas expands 450 times in volume and the small cylinder easily handles its job of inflating this equipment. These rafts are equipped with collapsible oars.

This safety equipment was manufactured by Walter Kidde & Company, makers of the Lux airplane fire extinguishing system which protected both motors of this powerful Lockheed. This is the same system which protects most of the giant passenger transport planes in the United States and foreign countries; in every country over which Mr. Hughes flew these same systems are in daily service. This extinguisher can kill an engine fire when a plane is hurtling along at top speed, regardless of the effect of the slipstream. The same company also manufactured the oxygen breathing apparatus carried by Mr. Hughes, and used while flying at high altitudes over Russia and between Alaska and New York.

Walter Kidde and Company is well known as the maker of all types of carbon dioxide fire extinguishing equipment, including portable extinguishers and built-in-systems for the protection of yachts, cargo boats, liners, electrical equipment, and serious industrial fire hazards.

RECENT CHANGES OF MASTERS

Marine Exchange, San Francisco

Steamer Makua: Wm. R. O'Brien, vice, H. O. Pennoyer.
Steamer Honolulan: M. E. Shigley; vice, F. H. Roberts.
Steamer Point Ancha: J. Tobiassen; vice, Walter Hansen.
Steamer Mauna Ala: F. I. Hamma; vice, L. A. Peterson.
Steamer J. A. Moffett: Harold S. Stengel, vice, H. O. Bleumchem.
Steamer Point Brava: J. T. Larsen; vice, E. H. Phillips.
Steamer Condor: R. J. Tierney; vice, C. T. Mauritz.
Steamer Manukai: K. Hubbenette; vice, O. Bergman.
Steamer Mana: O. Bergman; vice, J. B. Blaine.
Steamer Minnesotan: C. T. Gaidsick; vice, J. McAvoy.
Steamer H. D. Collier: H. O. Bleumchem; vice, S. C. Sullivan.
Steamer Florence Luckenbach: T. G. Eckert; vice, G. J. Sweeney.
Steamer Alabaman: Lester C. Hansen; vice, E. J. Anderson.
Steamer Coast Miller: L. A. Rasmussen; vice, Eric A. H. Watkins.
Steamer Lahaina: Fred N. Troup; vice, H. W. Heuter.
Steamer Lena Luckenbach: E. J. Sweeney; vice, R. Punjer.
Steamer Point Palmas: C. J. Wenzel; vice, George T. Nielsen.
Steamer Cathwood: Otto Weidman; vice, O. Phillipson.
Steamer Paul Shoup: O. E. Lilly; vice, G. A. Moerman.
Steamer Nabesna: C. E. Carlsen; vice, G. H. Swanson.
Steamer Point Ancha: W. C. Johnson; vice, J. Tobiassen.
Steamer K. I. Luckenbach: R. Punjer; vice, R. McKinnon.
Steamer Minnesotan: J. McAvoy; vice, C. T. Gaidsick.
Steamer R. J. Hanna: R. J. Melbye; vice, J. S. Christenson.
Steamer Solana: Oscar Bengtson; vice, J. Kristberg.

Automatic Combustion Control System

One of the primary considerations in the operation of boiler units, whether the installation is in a stationary plant or on shipboard, is that the consumption of fuel shall be set at the lowest possible point consistent with the generation of those quantities of steam required to maintain steam header pressure at a constant value. The only way in which this purpose can be accomplished is to adjust the supply of fuel and air in accordance with the load demands of the steam consuming units, and at the same time maintain the proper ratio between the rates of fuel and air supply. The installation of automatic combustion control equipment becomes almost a requirement if these purposes are to be fulfilled continuously. It is mandatory that a combustion control system installed on shipboard shall be as simple and direct acting as possible. Means must be provided for making all necessary calibration without the necessity for delicate adjustments, and it is equally necessary that the equipment shall remain in adjustment during a long period of service.

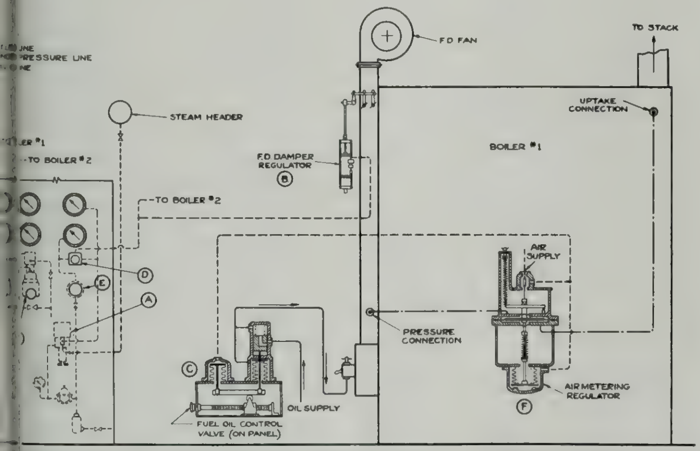
Tanker Hull No. 4334 now under construction at the Sparrows Point yard of Bethlehem Shipbuilding Corporation, is to be equipped with a fully automatic combustion control system supplied by the Hagan Corporation. This system is similar in design to equipment furnished for twenty other tankers of various lines which are already in regular service.

The combustion control system is of the full metering type and is designed to maintain a definite relation between the rates of fuel and air supply over the entire operating range. Adjustments are provided whereby this ratio will be maintained for various sizes of burner tips, and further adjustments are provided to meet those operating conditions which may require changes in the fuel-air ratio.

Referring to the accompanying control diagram, it will be noted that the master sender (A) is connected to respond to changes in steam header pressure, which may be considered as being indicative of variations in the demand for steam. This master sender establishes a pneumatic loading pressure varying in accordance with steam header pressure variations, and this master loading pressure is transmitted simultaneously to a receiving regulator (B) at each boiler unit and arranged for mechanical operation of the outlet dampers of the corresponding forced draft fan. Each receiving regulator has ample power for moving the dampers under all conditions, thus assuring that the response of the rate of air flow will always be strictly in accordance with the load demand and that the rate of firing will be adjusted accurately to meet these requirements.

A 3-way automatic-to-manual transfer valve (D) is located in the master loading pressure line to permit changing control of the forced draft fan dampers from the automatic control subject to the master sender loading pressure to manual control as dictated by a substitute loading pressure generated by adjustment of the manual control valve (E). The forced draft fan dampers are usually inaccessible from the firing floor, and this arrangement provides for adjustment of the dampers at will by merely turning a handwheel, rather than being required to make a corresponding adjustment through a complicated system of linkage.

Automatic adjustment of the rate of fuel and air supply in the proper ratio requires that each rate of supply be measured accurately and that the measurements so obtained shall be balanced against each other. The most accurate measure obtainable of the rate of air supply to the burners is the differential or draft loss across the boiler setting. The value of this differential is too small to balance against a corresponding differential set up by the rate at which



Schematic diagram of Hagan automatic combustion control to be installed in Bethlehem Hull 4334, the new Union Oil tanker.

oil is supplied to the burners. Therefore, an air metering regulator (F) is connected to measure the differential across the boiler setting and to amplify the value of this differential into a pneumatic loading pressure which shall be proportional to the draft differential and of a magnitude more nearly that of the oil flow differential. The loading pressure range used is between zero and 50 lbs. and the regulator is calibrated so that this loading pressure range corresponds with the full range of draft loss across the individual boiler unit being controlled.

The loading pressure from the air metering regulator at each boiler is transmitted to the bellows element of the corresponding oil control valve (C), and this valve maintains a balance between the loading pressure received and the pressure of fuel oil at the burners. The burner tips may be considered as orifices, and the supply pressure maintained ahead of these orifices will, therefore, serve as an accurate measure of the rate of fuel supply. The loading pressure from the air metering regulator is proportional to the draft loss across the boiler unit, and this draft loss or differential varies as the square of the rate of air flow. The same relation exists between the oil supply pressure and the flow of oil through the burners. Thus, the rate of oil supply will be varied directly with the rate of air flow, and the desired ratio of fuel and air will be maintained automatically by the oil control valve.

Adjustment of the ratio of fuel to air may be made by changing the position of the fulcrum in the oil control valve, and adjustment of this fulcrum position will not disturb any automatic function of the combustion control system. Each oil control valve is provided with a calibrated indicating gage (H), which serves as a guide to the operators, indicating the setting at the standard conditions under which the control is adjusted, as well as the extent and direction of any manual adjustment made subsequently. This feature is particularly valuable in enabling the operators to return the fuel-air ratio adjustment to the standard condition and determining at a glance the exact condition of the adjustment.

Each oil control valve is installed in a valved bypass connection to permit manual control of the firing rate. There is also a handwheel adjustment of the pressure setting of the master sender, which is located at the front of the control panel. These features, together with the manual control station, contribute materially to the convenience of operating the combustion control system, especially under port conditions when the demand for steam is practically constant and considerably reduced from the maximum requirements.

The design of each detail of equipment has been subjected to close scrutiny and the selection of material in every part has been made with equal care and with the object always in mind to assure continuous and reliable service over a long period of time. The amount of equipment has been kept at the minimum for the sake of convenience and ease of operation, and the correlation of the individual units into a complete combustion control system provides accurate and reliable proportioning of air and fuel and the proper relation between the boiler steaming rate and the load demand under all conditions of operation.

"United States Should Lead The World In Shipbuilding"

Speaking at San Francisco September 27 before a large and enthusiastic group of members and guests of the Propeller Club of California, George Barr, marine superintendent of the General Electric Company at San Francisco, and a turbine expert of national repute, sounded a ringing challenge to all shipminded Americans, as shown by the following excerpts from his address:

"There is no reason why the United States should not lead the world in shipbuilding. This country is much richer in progressive skill than in material wealth. Some of the vessels built in the last few years are examples of the very finest craftsmanship. These vessels have operating records that are very gratifying. Still, full advantage of all the available knowledge has not been taken, but the trend is definitely in the right direction and the U. S. Navy is leading the way.

"The modern cargo vessel, like other carriers, such as the modern motor truck, must be built for efficiency and abuse. Such a combination can be produced. Modern land turbines are so designed. The large turbines that furnish the power and light for the whole country have efficiencies far ahead of marine sets and they have a record for uninterrupted service unknown in any other field. There is no reason why the same conditions cannot be obtained in the marine field.

"Turbines in the smaller sizes cannot compete with these large units as far as actual consumption of fuel is concerned, but they can compete and surpass them in ruggedness and low maintenance costs and still can be designed with much higher efficiencies than anything we have seen up to the present.

"Marine reduction gears are progressing very satisfactorily and the next few years will show continued improvement; tooth loading is being lowered and finer materials are being used; all of which will make the gears last the ship out."

unning Lights of Pacific Shipping

DNEY G. WALTON

JOSEPH H. McEACHERN

CARL E. PETERSEN

Sydney G. Walton, newly appinted General Passenger Manager Matson Navigation Company. is elevation recently announced William P. Roth, president, aces him in charge of all Matson rvices. Mr. Walton retains his rmer position of Secretary of the g trans-Pacific fleet operators.

He is a graduate of Massachusetts stitute of Technology. Joined up th the Matson Line in 1927 as ssistant to the President. Later as named Secretary of Matson vigation . . . Oceanic Steamship o. Also served as Secretary and rector of the O. & O. Nav. Co. ed" was born (this century) . . . the city by the Golden Gate. He s a host of friends in travel cir- es . . . throughout America. Knows ssenger traffic thoroughly and ngs to his important new respon- ility a life-time's study of "pas- nger-preferred" service. Enjoys a mmanding marine view from his me in San Francisco.

Joseph H. McEachern, Manager of Marine Dept., Standard Oil Company of California. His career a convincing inspiration for the youth of today . . . he started as a cadet on the S.S. Ventura. With a chief's ticket his goal, his progress was rapid; engineered aboard Oceanic, Pacific Mail and good old Pacific Coast Steamship ships. His supers when aboard the State, the Queen, the Curacao, President, Governor, Senator, were (how many of you remember them?) August Kress . . . W. H. Allison.

With Standard Oil for 25 years. In '13 a salesman in Stockton, then in Nevada. To Phoenix next as Asst. Mgr. During war with Naval Reserve. Back to Phoenix . . . and in '19 appointed Dist. Sales Mgr. at Reno. Drafted to home office in '21 . . . various capacities in S. F. . . . organized Motor Vehicles Dept. Appointed to present executive post upon retirement of John C. Rohlfs. Lives in Marvelous Marin. Has a ranch on the road to the Geysers near Healdsburg.

Carl E. Petersen, Assistant Manager, Construction & Repair Dept., Matson Navigation Co., since January 1, 1938. Formerly Asst. to V.P. of Newport News Shipbuilding & D. D. Co. Vast experience in marine engineering and naval architectural posts . . . including Army Transport Service . . . U. S. Shipping Board . . . U. S. Mail S. S. . . . supervised reconditioning of "George Washington," "America," etc. He was for 5 years naval architect, charge Const. Dept. U. S. Lines . . . his principal work: the conversion-reconditioning of several liners to cabin class.

His education: Machine Design at Pratt Institute; Mech. Eng. at Tri-State College; and Polytechnic Inst. of Brooklyn (M.E. degree), U. S. Navy Steam Eng. School, Stevens Inst. Member: A. S. Naval Eng. ('17) A.S.M.E. ('18); S. of N.A. & M.E. ('15); Engineers' Club of N.Y. Many other technical societies. Commissioned as Lt. Comm. Volunteer Naval Reserve for Engineering Service. Now a real San Franciscan!

Propeller Club of California News

As announced in our last issue the Propeller Club of California sponsored the graduation exercises of the California Nautical School Ship held in the P. G. & E. auditorium on Friday evening September 2.

* * *

The event was most impressive. Some forty-five cadets of deck and engineering department received their diplomas amidst enthusiastic plaudits. Messages of counsel and well wishes were eagerly attended by the young men and their friends and many acclaimed the Propeller Club sponsorship as a notable milestone in the organization's progressive history.

The address of welcome was delivered by our president, **C. M. LeCount,** who in turn introduced **Kenneth W. Ingraham,** chairman of the Club's schoolship committee.

Chairman Ingraham kept the program running along on a fine schedule with an informality which kept his audience from getting too serious. He proved to be a "master-of-ceremonies" of no mean ability and other speakers taking their cue from him gave us sparkling talks.

Roger D. Lapham, Chairman of the Board of American-Hawaiian Steamship Company, was the happy choice for key speaker on the subject, "A Message to the Graduates." A commanding figure with unassuming rostrum manners, Mr. Lapham captured his audience with his plea for fair play, tolerance, and mental sobriety. He defined the elusive attributes of Leadership, remarking, "I'm not one to give my advice . . . as I don't take it myself!" Nevertheless, his comments must have left a definite impression on the graduates embarking on their merchant marine careers.

Charles L. Wheeler, executive vice-president of McCormick Steamship Company, awarded the prizes to meritorious students congratulating each in turn on distinguished accomplishments. Honored were John S. Bailey, Paul F. Lusse, and Chester H. Tubbs of the Deck Department, Guy D. Conover, Charles R. Hake, Howard L. Mollenkopf, Kelshaw Taylor of the Engineering Department.

The California Nautical School directorate was in attendance, with these members of the Board of Governors seated on the stage:

Robert B. McPherson, Chairman; Walter F. Dexter, Executive Member and Superintendent of Public Instruction; Robert H. Fouke, Vice Chairman; Robert Henderson, Captain U. S. N. (Retired); Robert S. Abernethy; J. C. Smith, Secretary.

Officers of the "California State": **Captain N. E. Nichols, U. S. N. (Retired);** Superintendent - Commander; **George Barkley,** Executive Officer; **R. C. Dwyer,** Chief Engineer; **Edwin C. Miller, Bennett M. Dodson, Ralph M. Sheaf,** Watch Officers; **David Warwick, John C. Ellis, Cyril G. Hansen,** Watch Engineers; and **J. M. Cadwell,** Supply Officer.

Assisting **Kenneth W. Ingraham** as Chairman were **Eugene V. Winter** and **Cyril L. Meek.**

The sterling young manhood as exemplified by the 1938 graduating class gave us new-born confidence in the future of the Pacific-American merchant marine.

● Meeting Reviewed

Capt. W. T. Lion, operating manager of Swayne & Hoyt, Ltd., gavelled a capacity audience to attention after lunch on September 13 when the Propeller Club of California reconvened for the fall voyage.

Chairman Lion introduced guest speaker **Capt. W. J. Petersen** of the Pacific American Steamship Association, who addressed the club on "Recent Marine Legislation and its Effects." Capt. Petersen gave his usual virile message and brought home to his hearers the necessity of eternal vigilance and concerted action in the combat against harmful marine legislation—as proposed for Federal enactment.

● Golfers Ahoy!

E. F. "Gene" Essner, chairman of the golf committee, predicts a record-breaking sign-up for the annual Propeller Championship to be held at the Olympic Club at Lakeside on October 6. Chairman Essner's hard-working Arrangements Committee—**Carroll Reeves, Julian Arnst, Vernon Showell,** and **Frank DePue** are receiving reservations and assembling an amazing array of trophies. There are four flights for members and two flights for Propeller guests.

Kenneth W. Ingraham.

● Turbine Talk

As we go to press announcements are in the mail naming **George Barr,** marine superintendent of the General Electric Company as speaker at the September 27 luncheon meeting. Mr. Barr recently delivered a spirited talk at the dedication of the new municipal power plant in Oakland and his Propeller audience may well anticipate a fine talk from this authority. His subject: "The Operation of Marine Turbines."

George E. Swett, member of the Board of Governors will be Chairman of the Day.

The place: The St. Julien Restaurant at 140 Battery Street.

SPERRY GYROSCOPE COMPANY
GEO. E. SWETT & COMPANY ENGINEERS

The 6 Musketeers who comprise the organization of George E. Swett & Co., Engineers. Left to right: Leighton Stone, William Pullen, Herb Southworth, Doris Cummings, Matt Dillingham and George Swett.

On deck and below!

Presenting the SIX MUSKETEERS

Come October 1st . . . it's four andles on the cake for the firm of eorge E. Swett & Company, En- neers.

Four years ago the present house- ag was floated to the San Francisco ay tradewinds with the transfer of e accounts formerly represented by e Western Engineering Company the Swett organization. Some ew lines were added to the marine- ipply firm's roster at that time and e present line-up shows them sell- g and servicing these manufac- irers: Carrier-Brunswick-Interna- onal, Inc.; Consolidated Ashcroft ancock Company, Inc.; Cuno En- neering Corp.; Davis Engineering orp.; Diamond Power Specialty orp.; Doran Company; Fisher overnor Company; Ilg Electric entilating Company; Kingsbury achine Works, Inc.; Markey achinery Co., Inc.; Warren Steam ump Co., and Yorkshire Copper orks, Ltd.

It is pleasant to review the prog- ss of this sales firm. With the ad- ent of each new representation ime the advisability of placing the ew administrative details in the inds of trained experts . . . men ho have specialized in marine and dustrial engineering . . . men qual- ed by long experience in their re- ective fields to make valuable rec- nmendations and to give service as emanded by a widely diversified ade.

This policy faithfully followed has counted for the firm's success. There is a pronounced business-like atmosphere throughout the quarters at 58 Main Street. At the same time the staff work so harmoniously for unified service that you might call them one happy, congenial, family.

Well, sir — your P. M. R. scout likes a good anniversary as well as the next fellow. So, camera-laden, he visited the building where he found all hands taking this Fourth Anniversary well in stride. We assembled the sextette for a photograph and it came out exceptionally good as you will see from our illustration. You'll probably notice the little lady first.

She's Doris Cummings, charter employee who has been an able right-hand of Mr. George E. for fourteen years. Miss Cummings is termed a super saleswoman by her associates. It is her smile that greets you as you enter; a fine launching of any business transaction. The boys depend on her for the handling of the accounts, the cash, and those multitudinous details which only a clever little lady can attend to.

And now that we have entered the offices and have received the salutary welcome, come along and meet the men folks!

That's Leighton Stone over there in the front office. Leighton has charge of Fisher Governor, Consolidated, Cuno, and Ilg sales and service. He's the sort of a chap who gets down to fundamentals when he is selling a product and wants to learn all there is to know about it. That's why he has visited intensively at factory headquarters. He's covered them all from Consolidated in Connecticut to Fisher in Iowa, learning at first hand factory procedure, rudiments of design and performance. As we listen in . . . Leighton is being slyly ribbed about his new mustache. Someone remarks that the next So'easter will take it like bread takes gravy . . . to which nifty Leighton turns a Stone ear!

Next we meet Matt Dillingham, the refrigeration and air-conditioning authority in charge of the Carrier business which, of course, includes the good old Brunswick ice machine. The prominence of Carrier in the marine field and particularly aboard ships operating out of San Francisco is due immeasurably to the service rendered by Matt's department.

And that's Bill Pullen in the next office we enter. Bill can well be termed the dean of pump men out here on these shores. He'll talk Warren pumps with you till the cows come home. He'll tell you how they are standard equipment for Naval, and merchant marine purposes. "I'm an old pump hand!" is his theme and boy, does he know his subject! Years ago he was with De Laval; then with the Fairbanks-Morse people . . . right good training, if you ask us.

That chap with the patient smile is Herb Southworth, manager of Service and Installations. Herb supervises all jobs of installing; he

checks engineering calculations, shoots trouble, and keeps the customers mighty happy. Herb has discovered and adopted some secret philosophic formula for getting a kick out of life, as the going never gets too tough for him . . . and he's usually smiling! Herb puts it this way: "Trouble-shooting is good clean fun around here. You see—our factories build 'em trouble-free to begin with!"

Now shake hands with the skipper, George E. Swett. His office is doorless. Fellows like to drop in and talk things over with him. They find him days ahead on the news of the shipping trade. He keeps posted! Just as soon as a draftsman lays the first mark on a ship plan, George apparently hears about it. He's a down-Easter . . . state of Maine man . . . who will tell you that he was 17 years old before he knew there were other fish besides cod. (That's George at the extreme right in the photo. Big fellow, eh?) He'll tell you the story of his life in fifty split seconds . . . something like this:

"Born on the rock-bound coast of Maine about 30-40 years ago. Lost my hair shortly after marrying. Grandpappy built sailing ships. I made my first voyage from Bangor to Boston and joined General Electric. They sent me to Schenectady for elaborate apprentice training. When full-fledged I came out to the Seattle G. E offices. This would be about 1913. Went with that 'old master' Allan Cunningham, pioneer winch designer and builder—and my first trips to San Francisco were as a Cunningham winch salesman. First it was all steam . . . then electric as well. I've been down here ever since—some 18 years now. Did I tell you the story about——"

George was one of the founders of the Western Engineering Company, the supply firm which was eventually to bear his name.

And that's the organization at 58 Main Street 6 musketeers all for one and one for all! The business, like so many others, has survived the depression valiantly and by dint of hard work with an optimistic outlook, they have surmounted some rather discouraging years. During the tough going George Swett stuck by his guns and instead of cutting down on his personnel, he actually increased the firm's selling strength. When he figured business would be harder to get, his policy was to go after it harder . . . and further. An abiding faith in San Francisco has now rewarded him and there are bountiful months and years out ahead for George and his staff!

We like to chronicle such courage. We like to say nice things about folks who deserve them. Perhaps we haven't told you anything particularly new about this group at 58 Main—as they are all familiar faces and personalities to so many of you. But we are sure you'll join with P. M. R. in saluting them on their Anniversary and will wish them good luck on many more voyages.

● Wintemute to New Post

Transfer of **R. S. Wintemute,** Vice-President in Charge of the Northern District, to San Francisco as Vice-President in Charge of Traffic, was announced recently by **Harry S. Scott,** President of General Steamship Corporation, Ltd. The change will be effective October 1, 1938.

Wintemute originally joined the forces of the General Steamship Corporation in 1920, his first duties having been concerned with the development of the Australian and South American Services of the Company. He subsequently assumed general charge of the Company's traffic activities and was appointed Vice-President in Charge of Traffic in 1931 with headquarters at San Francisco. In 1934 he took charge of the Northwest District, where he gained much valuable experience which he is now bringing back to his former position.

Scott also announced the promotion of **J. W. Allen** to the position of Manager, Northwest District. In this capacity, Allen, who has been connected with the Company for the last four years and who has been engaged in the steamship business in the Pacific Northwest for the past 25 years, will take over the major part of the duties heretofore handled by Wintemute in the supervision of the Company's activities in the Northwest. R. K. Brown, Jr., and V. A. Driscoll will continue to serve as local managers of the Seattle and Portland offices, respectively.

Reuben H. Chase.

ELECTED V. P. OF PLANT RUBBER & ASBESTOS

Election of **Reuben H. Chase,** General Manager of Plant Rubber & Asbestos Works, West Coast's largest manufacturer of asbestos materials, as Vice-President and General Manager of the firm, was announced recently.

Plant Rubber & Asbestos Works manufacture 85 per cent Magnesia Pipe and other forms of insulation. They also manufacture the most extensive and complete line of high-grade Mechanical Packings on the Pacific Coast.

Founded in San Francisco in 1898, Plant has enjoyed steady growth and is now the largest manufacturer of asbestos materials in the West, having sales offices in San Francisco, Los Angeles, Oakland, and Wilmington. Factories are located at Redwood City, San Francisco, and Los Angeles, their plant at Redwood City being the only Pacific Coast owned Magnesia factory. Distributors are located in the principal cities of the Middle West and East, as well as throughout the Pacific Coast.

WM. MACDONALD HEADS BAY CITIES MACHINE CO.

William Macdonald, well known throughout San Francisco Bay marine and industrial circles, is now proprietor of the new Bay City Machine Co., successors to the pioneer E. W. Tucker & Co., Inc., organization. The recently formed Bay City Machine Co. has a completely fitted machine shop at 347-349 Fremont St.

HUNT-SPILLER
Air Furnace Gun Iron

A special material built to meet severe requirements. Its uniform quality and unsurpassed wear-resisting properties insure maximum service, highest efficiency, minimum fuel consumption and low maintenance costs.

Steam or Diesel—You need something more than ordinary material to combat the severe action of high temperatures and high pressure developed inside the cylinders of your engines.

Application of HSGI liners, heads, pistons and piston rings to your main or auxiliary engines offer big savings in cost of operation.

HUNT-SPILLER MFG. CORPORATION
383 Dorchester Ave. South Boston, Mass.

V. W. ELLET
Pres. & Gen. Mgr.
383 Dorchester Ave.

E. J. FULLER
Vice President
South Boston, Mass.

Thos. G. Baird
16 California Street
KE-1142
San Francisco

HUNT-SPILLER *Air Furnace* GUN IRON

The Name That's Known in Every Port

Ships that sail the seven seas have made the name A-E-CO a symbol of dependable Deck Auxiliaries throughout the world. That reputation for dependability is the chief reason for A-E-CO's leadership since 1865. Year after year, ship designers, builders, and operators have chosen A-E-CO for an ever increasing number of important installations. Specify A-E-CO!

Other A-E-CO Products: Lo-Hed Hoists, Hele-Shaw Fluid Power, Taylor Stoker Units

A-E-CO DECK Auxiliaries

AMERICAN ENGINEERING COMPANY

2450 ARAMINGO AVENUE, PHILADELPHIA, PA.
Pacific Coast Representative: HOUGH & EGBERT, Inc. 311 California Street, San Francisco

Building in American Yards

Pacific Coast

BETHLEHEM SHIPBUILDING CORPORATION, LTD.

(Union Plant)
San Francisco

DRYDOCK AND ROUTINE REPAIRS: **M.S. Kern, Peter Lassen, U.S.S. Nevada, Cuzco, H. D. Collier, W. H. Berg, Knud Rasmussen, Condor, Tug A. G. Wells, M.S. Charles Racine, Vitus Bering, W. S. Miller, U.S.A.T. Meigs, U.S.S. Ranger.**

CAMPBELL MACHINE COMPANY

Foot of 8th Avenue
San Diego, Calif.

NEW CONSTRUCTION: **American Beauty, 142-foot brine tuna clipper** powered with 6 cyl. 600 H.P. Union diesel engine, for Van Camp Sea Food Co. **Completion date October 1, 1938.**

DRYDOCK AND ROUTINE REPAIRS: **Roosevelt, City of San Diego, Liberty, Star of the Sea, Queen Mary, Olympia, Picaroto, Sea Boy, Golden Gate, Donna Jo.**

FELLOWS & STEWART, INC.

Wilmington, Calif.

NEW CONSTRUCTION:

Contract No. 672, 75 foot overall Class "N" sloop. **Completion date about October 1, 1938.**

Contract No. 673, 41 foot cutter. Deliverey date about October 1, 1938.

GENERAL ENGINEERING & DRY DOCK CO.

Foot of Fifth Avenue
Oakland, Calif.

DRYDOCK AND ROUTINE REPAIRS: **Barge Foy No. 10, Gas. S. St. Mary, Carfloat No. 2, Gas S. Star of Monterey, Tug Oakland, Carfloat No. 1, El. S. Yerba Buena, Noyo, West Ira.**

HARBOR BOAT BUILDING CO.

Berth 264, Fish Harbor
Terminal Island, Calif.

DRYDOCK AND ROUTINE REPAIRS: **Purse Seiners Kingfisher and Sea Tern.**

HONOLULU IRON WORKS

Honolulu, T. H.

DRYDOCK AND ROUTINE REPAIRS: **Golden Cloud, Lihue, Chickasaw City, Golden Cross, M.S. Jeff Davis, Makaweli, Malama, Matsonia, Kahuku, Golden Sun, Ewa, Hamakua, Yacht Dwyn Wen, Kaimoku, Mariposa, Yacht Navigator, Dickenson.**

LAKE WASHINGTON SHIPYARDS

Houghton, Wash.

DRYDOCK AND ROUTINE REPAIRS: **Yacht El Primero, M.S. Setac.**

LOS ANGELES SHIPBUILDING & DRY DOCK CORP.

Los Angeles Harbor
San Pedro, Calif.

DRYDOCK AND ROUTINE REPAIRS: **Olympic, U.S.C.G.C. Itasca, Scotia, W. T. Borax Barge No. 10, Topila, Cascade, El Capitan, Lihue, Camden, Golden Sun, M.V. Hindanger.**

MARE ISLAND NAVY YARD

Mare Island, Calif.

NEW CONSTRUCTION:

Sturgeon, Submarine (SS187); keel laid October 27, 1936; launching date March 15, 1938; commissioned June 25, 1938; **completion date September 2, 1938.**

Swordfish, Submarine (SS193); keel laid October 27, 1937; estimated delivery date August 1, 1939.

Order received for construction of two harbor tugs, YT 133 and YT 134, dated October 7, 1937.

Garbage Lighter (YG 21); keel laid July 25, 1938.

Order received for construction of one submarine tender, Fulton (AS 11); dated June 30, 1938.

Order received for construction of one submarine, Tuna (SS 203); dated June 30, 1938.

DRYDOCK AND ROUTINE REPAIRS: **Memphis, Portland, Langley, Drayton, Flusser, Lamson, Mahan, Moffet, Porter, Balch, Lapwing, Oriole, Turkey, Grebe, Tarpan, Perch.**

THE MOORE DRY DOCK CO.

Oakland, Calif.

DRYDOCK AND ROUTINE REPAIRS: **Canadian, Dorothy Wintermote, Katrina Luckenbach, El Segundo, Tug Creole, Oregonian, Tug A. H. Payson, J. L. Luckenbach, St. Whl. Frances, Hawaiian, Aldington Court, Mauna Loa, Mathew Luckenbach, Silverbelle, Iowan, Silverwalnut, Pennsylvanian, Capt. A. F. Lucas, Virginian, Union Oil Barge 1923, Hegira, American, Purse Seiner Linde, Tug Hercules, Silvermaple.**

THE PUGET SOUND NAVY YARD

Bremerton, Washington

NEW CONSTRUCTION:

U.S.S. Wilson (Destroyer No. 408); standard displacement, 1500 tons; keel laid March 22, 1937.

U.S.S. Charles F. Hughes (Destroyer No. 428); standard displacement 1600 tons; order placed by Navy Department December 7, 1937.

Ships authorized but work not started: 2 harbor tugs Nos. 138 and 139; 2 seaplane tenders AVP10 and AVP11; 1 destroyer DD436, Monssen.

DRYDOCK AND ROUTINE REPAIRS: **New Mexico, California, Louisville, Patterson, Jarvis, Lexington.**

TODD SEATTLE DRY DOCKS, INC.

Harbor Island
Seattle, Wash.

DRYDOCK AND ROUTINE REPAIRS: **Tug Iroquois, Pile Driver Tillicum, Barge RB No. 4, Dredge Missouri.**

WESTERN BOAT BUILDING CO., INC.

2505 East 11th Street
Tacoma, Wash.

NEW CONSTRUCTION:

Hull No. 131, purse seine fishing boat, 78'x20'x9'; 200 H.P. Atlas engine; launching date May 1, 1938.

Hull No. 132, 50' pick-up fishing boat for New England Fish Company. Keel laid March 12, 1938.

Atlantic, Lakes, Rivers

ALABAMA DRY DOCK AND SHIPBUILDING CO.

Mobile, Ala.

NEW CONSTRUCTION: **Two all welded steel barges** 225' x 35' x 10' 3" for Standard Oil Co. of Kentucky.

Six all welded steel barges 128' x 32' x 7' 10" for the International Paper Co.

Names & News

A. A. ARCHIBALD

On September 1 Matson Line rought A. A. Archibald to San 'rancisco to take over the post of eneral agent in that city, removing im from the capacity of general assenger agent in Los Angeles, here he had been stationed since 934, to effect the change. His Los ngeles post has been filled by **B. Hurd,** who was previously in harge of the company's London of-ce.

Mr. Archibald joined Matson Line 1 1920, since which time he has :rved ashore and afloat. Mr. Hurd's ervice dates from 1924, and in-ludes various dock office and pur-er's office posts. He was purser of ie old Matsonia in 1928, whence in ie following year he went to New 'ork as assistant general agent, ien to Chicago as general agent, nd finally, three years later, opened ie London office.

FRED H. MARVIN

From Seattle comes news of the lection on August 24 of Fred H. Iarvin, president of the Port of Tacoma, as vice president of the Pacific Northwest Oriental Line, Inc., the firm organized to revive shipping between Puget Sound and the Orient.

He was elected at a recent meeting of the directors of the company.

WILLIAMS, DIMOND & CO.

Charles Krueger, head of the C. G. Krueger Company, on September 1 revealed that Williams, Dimond & Co. have been appointed agents in San Francisco for the Transportes Maritimos, a new Mexican steamship company which has started operations between California and the west coast of Mexico. Mr. Krueger is the Pacific Coast agent for the line.

The new line is subsidized by the Mexican government and is part of the republic's program to develop its merchant marine. The line is operating only one ship at the present time, the Baja California, but Mr. Krueger said that the Mexican Government is having built six new merchant ships of which three will be assigned to the West Coast.

American-Hawaiian To Golf

Follows the colorful announcement covering The American-Hawaiian Steamship Company's Seventh Annual Invitational Golf Tournament: Place—La Rinconada Golf Club, 1 mile north of Los Gatos, Calif. Tee Off Time—Sunday, October 2, 1938, 8:30 to 10:30 a. m.

7 . . . so they say, is a lucky number.

We hope you'll come down to La Rinconada to help us prove the saying by playing in our Seventh Annual Tournament. The course is its usual smooth self; we can almost guarantee the weather; and we can certainly guarantee and recommend the prize list.

Special 4-somes for ladies.

After "The Game," the party will reassemble (about 2 p. m.) for lunch, and to receive a lengthy list of prizes — we hope you will be there.

The club house, with bar and buffet service; also picnic ground facilities, can be enjoyed by your family, or friends, who do not care to join you on the course.

Please let us hear from you not later than September 24.

John Pruner, Chairman

FRANCE

TRADE MARK

Manufactured exclusively by

FRANCE PACKING COMPANY

Main Office and Factory

TACONY, PHILADELPHIA

Sole Autho i-ed R presentatives:

SAN FRANCISCO—HERCULES EQUIPMENT & RUBBER CO.
550 - 3rd Street—EXbrook 2575

SEATTLE—GUY M. THOMPSON
1241 South Alaskan Way—Phone MAin 1870

PORTLAND—E. B. HUSTON
127 S. W. First Ave.—Phone ATwater 6754

LOS ANGELES—A. C. ELDER
2714 South Hill St.—PRospect 9529

NEW YORK CITY—FRANCE PACKING COMPANY
Room 107-E, 30 Church St.—Cortlandt 7-6827

As you land, *Hawaii* takes you prisoner with a flower *lei*. Thereafter, in memory, you remain her captive.

FARES: (*each way*) *California to Honolulu*
FIRST CLASS *from* $125 • CABIN CLASS *from* $85

Hotel reservations at Royal Hawaiian or Moana at Waikiki are made when booking steamer passage.

MATSON SOUTH PACIFIC CRUISES every 4 weeks to New Zealand and Australia. *Personally-escorted*. 48 days... 12 shore excursions...more than 17,000 miles. All-inclusive-cost, complete cruise, First Class, *from* $775.

SHIPPERS: The *Lurline* and *Matsonia* provide swift freight service to Hawaii. The *Mariposa* and *Monterey* continue to New Zealand and Australia via Samoa and Fiji. All four ships have modern refrigeration facilities. Also regular and frequent freighter service from Pacific Coast ports.

Details from Travel Agents or:

MATSON LINE - OCEANIC LINE

San Francisco - Los Angeles - Seattle - San Diego - Portland

S.S. LURLINE · S.S MONTEREY · S.S. MARIPOSA · S.S. MATSONIA

DRYDOCK AND ROUTINE REPAIRS: **Hagen, Paco, Phoenix, Clare, Gargoyle, Swift Scout, Coppename, Topa Topa, Swift Arrow, Point Bonita, Meton, C. B. Watson, Steamboat Missouri.**

BATH IRON WORKS

Bath, Maine

NEW CONSTRUCTION: **Hulls Nos. 162 and 163; DD395 Davis and DD396 Jouett; two 1850-ton destroyers for U.S. Navy;** date of contract September 19, 1935. Keels laid, No. 162, July 28, 1936; No. 163, March 26, 1936. Launching dates, No. 162 July 30, 1938; **No. 163 September 24, 1938; estimated delivery dates October** and December, 1938, respectively.

Hulls Nos. 170-171, DD409, Sims, and DD410, Hughes, two 1500-ton destroyers for U. S. Navy; contract date October 12, 1936; keels laid July 15 and September 15, 1937, respectively; launching dates, indefinite; delivery dates April, 1939, and June, 1939, respectively.

Hulls Nos. 177 and 178, DD423 and DD424, two 1620-ton destroyers for U. S. Navy. Contract date September 30, 1937; delivery dates April and June, 1940, respectively.

BETHLEHEM SHIPBUILDING CORPORATION, LTD.

Fore River Plant,
Quincy, Mass.

NEW CONSTRUCTION:

CV7, Wasp, Airplane Carrier for U. S. Government; keel laid April 1, 1936; estimated launching date December, 1938.

Hulls Nos. 1467, 1468, 1469, three passenger and freight steamers for Panama Railroad S.S. Co.; 486 feet x 64 feet x 38 feet 6 inches; 16½ knot speed. Keels laid, Nos. 1467 and 1468, October 25, 1937; No. 1469, November 15, 1937; **estimated launching dates September 24, 1938,** November, 1938, and January, 1939.

Hulls Nos. 1470 and 1471, two 1500-ton destroyers for U. S. Government; delivery dates March, 1940, and May, 1940.

Hulls Nos. 1472 and 1473, two diesel powered trawlers 147'0" overall, 128'9" perps., 27'0" beam, 14'4" depth; estimated delivery dates November 15 and December 15, 1938.

BETHLEHEM SHIPBUILDING CORPORATION, LTD.

Sparrows Point Plant
Sparrows Point, Md.

NEW CONSTRUCTION:

One tanker for Texas Co.; about 13,000 deadweight tons; steam turbine; **launched September 1, 1938.**

Hull No. 4334; one 13,000 dwt. oil tanker for Union Oil Co. of Calif. Contract signed March, 1938.

Hulls Nos. 4329, 4330, 4331; three 16,300 dwt. ton tankers for Standard Oil Co. of N. J.; 18 knots speed. Contract signed January 3, 1938.

Hulls Nos. 4332 and 4333; two 16,000 dwt. tankers for Socony Vacuum Oil Co. Contract signed February, 1938.

BETHLEHEM SHIPBUILDING CORPORATION, LTD.

Staten Island Works
Staten Island, N. Y.

NEW CONSTRUCTION:

Hull No. 856, fireboat for City of New York. Length O.A. 134'0", breadth 32'0", depth 13'3". Keel laid April 19, 1938; **launched August 26, 1938; estimated delivery date September 22, 1938.**

Hulls Nos. 8001, 8002, and 8003, three U. S. Navy fleet tugs. No. 8001, keel laying date January 24, 1939; launching date July 11, 1939; delivery date January 25, 1940. No. 8002, keel laying date February 7, 1939; launching date September 5, 1939; delivery date March 25, 1940. No. 8003, keel laying date February 21, 1939; launching date November 7, 1939; delivery date May 25, 1940.

BOSTON NAVY YARD

Boston, Mass.

NEW CONSTRUCTION:

DD402, Mayrant, and DD403, Trippe, two light destroyers for United States Navy; LBP 334', beam 35'6", depth 19'8"; keels laid April 15, 1937; launched May 14, 1938; estimated delivery dates October, 1939, and November, 1939, respectively.

DD415, O'Brien, and DD416, Walke, two destroyers; LBP 341', beam 36', depth 19'8"; keels laid May 31, 1938; delivery date 1940.

DD425, Madison, and DD426, Lansdale, two destroyers; 341'0" x 36'0" x 19'8". Keel laying date December 1, 1938; launching date November 1, 1939; delivery date 1940.

One harbor tug for U. S. Navy; 98'0" LBP x 24'0" x 13'6"; keel laid March 28, 1938; launched June 10, 1938; **completion date September 15, 1938.**

DD433 and DD434, two destroyers, contract awarded July 23, 1938.

BROOKLYN NAVY YARD

Brooklyn, N. Y.

NEW CONSTRUCTION:

CL 50, **Helena, light cruiser;** L.B.P. 600', beam 61'7¾", standard displacement 10,000; geared turbine engines; express type boilers; keel laid December 9, 1936; launched August 27, 1938; estimated delivery January 2, 1940.

BB 55, **North Carolina, battleship;** L.BP. 714' 0", beam to outside armor 108' 0", std. displ. 35,000 tons; geared turbine engines; express type boilers. Keel laid October 27, 1937; estimated launching date May 1, 1940; contract delivery September 1, 1941; estimated delivery date October 15, 1941.

CHARLESTON, S. C., NAVY YARD

Charleston, S. C.

NEW CONSTRUCTION:

Order placed for **one harbor tug;** LOA 124' 9", length between perpendiculars 117', breadth molded 28', depth molded 16'; keel laid August 2, 1937; launched March 7, 1938.

Order placed for **one harbor tug;** LOA 110' 3", LBP 98' 0", breadth 24' 0", depth at side amidships 13' 6". No dates set.

Order placed for one **harbor tug;** 65 feet long.

DEFOE BOAT & MOTOR WORKS

Bay City, Mich.

NEW CONSTRUCTION:

Hulls Nos. 72 and 73; two diesel electric harbor cutters for Coast Guard; 110' x 26' 6"; powered by 1000 S.H.P. General Motors engines; steel construction. Delivery date April, 1939.

THE DRAVO CORPORATION

Engineering Works Division
Pittsburgh, Pa., and Wilmington, Del.

NEW CONSTRUCTION:

Hulls Nos. 1462-1465; four welded cargo box barges 100' x 26' x 6'6", for stock; 660 gross tons.

Hulls Nos. 1468-1475; eight welded W-5 coal barges 175' x 26" x 10'8", for stock; 3776 gross tons.

Hull No. 1476; one welded steel coal barge 126' x 34' x 17' for M. & J. Tracy, Inc.; 673 gross tons.

Hulls Nos. 1477-1479; three welded hopper type steel coal barges 195' x 36' x 11', for Marquette Cement Mfg. Co.; 2160 gross tons.

ELECTRIC BOAT CORP.

Groton, Conn.

NEW CONSTRUCTION:

Hull No. 29, Sargo (SS188); standard displacement 1450 tons; keel laid May 12, 1937; launching date June 6, 1938; delivery date February, 1939.

Hull No. 30, Saury (SS189); standard displacement 1450 tons; keel laid June 28, 1937; launching date August 20, 1938; delivery date April, 1939.

Hull No. 31, Spearfish (SS190); standard displacement 1450 tons; keel laying date September 9, 1937, **launching date October 29, 1938;** delivery date June, 1939.

Hull No. 33, Seadragon (SS194); 1450 tons; keel laying date April 18, 1938; delivery date December, 1939.

Hull No. 34, Sealion (SS195); 1450 tons; keel laying date June 20, 1938; delivery date February, 1940.

Hull No. 35, Tambor (SS198); standard displacement 1475 tons; keel laying date January 16, 1939; delivery date January, 1941.

Hull No. 36, Tautog (SS199); standard displacement 1475 tons; keel laying date March 15, 1939; delivery date March, 1941.

Hull No. 37, Thresher (SS200); standard displacement 1475 tons; keel laying date May 15, 1939; delivery date May, 1941.

THE FEDERAL SHIPBUILDING AND DRYDOCK COMPANY

Kearny, N. J.

NEW CONSTRUCTION:

Three destroyers, DD397 Benham, DD398 Ellet and DD399 Lang, 1500 dis. tons; keels laid September 1, 1936, December 3, 1936, and April 5, 1937, respectively; launching dates April 16, June 11 and August 27, 1938, respectively.

Two destroyers, DD411 Anderson and DD412 Hammann; keels laid November 15,

903 FIFE BLDG.
1 DRUMM ST.

THOMAS A. SHORT

Successor to

C. V. LANE

Marine Representative:
Thos. A. Short,
1 Drumm Street, San Francisco

HYDE STEERING GEARS
HYDE WINCHES
HYDE WINDLASSES
HYDE CAPSTANS
HYDE MANGANESE BRONZE PROPELLERS & CASTINGS
A. B. SANDS & SON CO., PLUMBING FIXTURES
SMOLENSKY NOISELESS CHECK VALVES
CATERPILLAR TRACTOR CO. MARINE POWER PLANTS AND AUXILIARY SETS
BACHARACH INDUSTRIAL INSTRUMENT COMPANY
DIEHL MFG. CO. FANS, MOTORS, GENERATORS
SUBMARINE SIGNAL COMPANY FATHOMETER
SHENANGO-PENN MOLD CENTRIFUGALLY CAST LINERS
WELIN QUADRANT AND SHEATH SCREW DAVITS
WELIN-MACLACHLAN GRAVITY DAVITS
WELIN LIFEBOAT WINCHES
WELIN METALLIC LIFEBOATS AND LIFERAFTS
SHORT OIL SEPARATOR
WILLIAM W. NUGENT & CO., OIL FILTERS
U. S. METALLIC PACKING
CONSOL RUST REMOVER
CONSOL RED and BLACK

B. F. GOODRICH CUTLESS RUBBER BEARINGS
MEEHANITE CASTINGS—PISTON RING STOCK, BURNER CONES, ETC.
SHORT OIL DETECTING SERVICE FOR PROTECTING BOILER FEED WATER AND FUEL OIL HEATERS

Hyde Windlass Company

Steering Gears, Windlasses, Capstans, Bronze Propellers —as installed on America's finest ships.

Bath, Maine

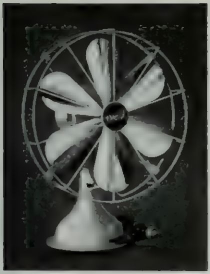
Pacific Coast Representative:
Thos. A. Short, 1 Drumm Street, San Francisco

Inter-Coastal Paint Corporation

SAN LEANDRO, CALIFORNIA

Originators and sole manufacturers of CONSOL both plain and in colors. A conditioning solution for metal surfaces that have become corroded. Not only a scale remover but a preservative as well. Gives excellent results when applied to boottop belt, hull, holds, bilges, tank tops, chain lockers, ventilator trunks, decks and so forth. Is non-inflammable and contains no acids or chemicals that are injurious to men or metal.

Marine Representative
Thos. A. Short, 1 Drumm Street, San Francisco

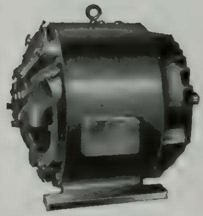


Marine Motors, Generators and Ventilating Equipment

DIEHL MANUFACTURING COMPANY

Electrical Division of
THE SINGER MANUACTURING CO.
Elizabethport, New Jersey

San Francisco Representatives:
MARINE ELECTRIC CO. Desk and Wall Fans
THOMAS A. SHORT Motors, Generators, etc.



DAHL-BECK ELECTRIC CO.

- MARINE AND INDUSTRIAL INSTALLATIONS
- MOTOR AND GENERATOR REPAIRING

Representatives for

VAN BRUNT WATERTIGHT FIXTURES AND FITTINGS
A.D.T. AERO AUTOMATIC FIRE ALARM SYSTEMS
C. C. GALBRAITH & SON, INC.—Loud Speaker Systems
SPEER CARBON AND GRAPHITE BRUSHES

115 MISSION STREET - SAN FRANCISCO
Phone: EXbrook 5215

1937, and January 17, 1938, respectively.

Hull No. 150, one 12,900-ton tanker for Pan American Petroleum and Transport Co.; 440′ B.P. x 66′6″ x 34′6″, 450′ O.A.; Isherwood Arcform design of hull form and longitudinal hull framing. Keel laid January 10, 1938; launching date July 22, 1938; **delivered.**

Hulls Nos. 151, 152 and 153, three tankers for Standard Oil Co. of New Jersey; keels laid, No. 151, July 1, 1938; No. 152, July 15, 1938.

Hulls Nos. 154-159, six C-2 cargo vessels for U. S. Maritime Commission. Keel laid, No. 154, August 25, 1938.

Hulls Nos. 160 and 161, two torpedo boat destroyers for the United States Navy.

INGALLS IRON WORKS CO.

Birmingham, Ala.

NEW CONSTRUCTION:

One 15-ton derrick boat hull for U.S. E.D.; launched June 1, 1938.

Two diesel dredge tenders 63′ x 15′6″ x 6′3″ for U. S. Engineer Office, Memphis, Tenn. **Launching date about September 10, 1938.**

Ten hopper type cargo barges 280′ x 48′ x 11′ for Inland Waterways Corp. **Launching dates June to October, 1938.**

JAKOBSON & PETERSON, INC.

Brooklyn, N. Y.

NEW CONSTRUCTION:

Hull No. 276, 86-foot all welded steel tug. Launching date August 31, 1938; **delivery date October 1, 1938.**

LEVINGSTON SHIPBUILDING CO

Orange, Texas

NEW CONSTRUCTION:

Two all welded anchor barges 55′ x 20′ x 5′, equipped with 2-drum gasoline hoist, for U. S. Engineer Office, Galveston, Texas. **Delivery date September, 1938.**

Three all welded cargo barges 140′ x 30′ 2½″ x 9′; delivery date November, 1938.

One all welded tugbot 80′ LOA, 19′ 7″ beam overall, 9′ depth molded; powered with 380 H.P. Atlas diesel.

One all welded passenger ferry 132′ LOA, 40′ 8½″ beam overall, 10′ depth. Equipped with two 200 H.P. Atlas diesel engines. Delivery date December, 1938.

THE MARYLAND DRYDOCK CO.

A Subsidiary of Koppers Company, Baltimore, Maryland

NEW CONSTRUCTION:

Hull No. 194, single screw steel derrick lighter for U. S. Engineer Office, N. Y. District. LOA 115′ 9⅜″ LBP 110′, beam overall 30′ 8¾″, beam molded 30′, depth molded 11′ 9″, frame spacing throughout 21″, load displacement 438 tons, mean load draft molded 9′ 2½″. Keel laying date September, 1938; estimated launching date December 1938.

DRYDOCK AND ROUTINE REPAIRS: **Lightship No. 84, St. Johns.**

THE NEW YORK SHIPBUILDING CORPORATION

Camden, N. J.

NEW CONSTRUCTION:

Hull No. 416, Phoenix (CL46), light cruiser; 10,000 tons; for U. S. Navy Department; keel laid 1937; launched March 12, 1938.

One destroyer tender for U. S. Navy; order placed December 27, 1937.

One seaplane tender for U. S. Navy; order placed December 27, 1937.

NEWPORT NEWS SHIPBUILDING & DRYDOCK CO.

90 Broad Street, New York

NEW CONSTRUCTION:

H362, light cruiser, CL49, St. Louis, keel laid December 10, 1936; launched April 15, 1938; delivery date March, 1939.

Hulls Nos. 363-364, two destroyers, Nos. 413, Mustin, and 414, Russell; keels laid December, 1937; delivery dates June and August, 1939.

Hull No. 369, twin screw mail, passenger and cargo liner for United States Lines Co.; length 723′, beam 92′, depth 45′. Keel laying date August 22, 1938.

Hulls Nos. 370, 371 and 372, three oil tankers for Standard Oil Company of New Jersey; gross tonnage about 11,500 tons; L.B.P. 525′, breadth molded 75′, depth molded 39′.

Hulls Nos. 373, 374, 375 and 376, four single screw cargo vessels for United States Maritime Commission; turbine propulsion; gross tonnage about 9000 tons; length 435′, breadth 63′, depth 40′6″.

PORTSMOUTH, N. H., NAVY YARD

Portsmouth, N. H.

NEW CONSTRUCTION:

Six submarines, Sculpin, Squalus, Searaven, Seawolf, Triton and Trout.

THE PUSEY & JONES CORP.

Wilmington, Del.

NEW CONSTRUCTION:

Hull No. 1070, one steel hopper dredge, Chester Harding; 2,500 cubic yard capacity; length overall 308′2″, length B.P. 300′0″, breadth molded 56′0″, depth molded 29′0″. Contract date February 14, 1938; keel laid May 15, 1938; delivery May, 1939.

Hull No. 1071, one steel lighthouse tender, Lilac Class, for Dept. of Commerce, Bureau of Lighthouses. Gross tonnage approximately 700 tons.

SUN SHIPBUILDING AND DRY DOCK COMPANY

Chester, Pa.

NEW CONSTRUCTION:

Hulls No. 172, 173 and 174, three tankers for Standard Oil Co. of New Jersey; steam turbine; 525′ x 75′ x 39′; 16,300 dwt. Keel laying dates April 18, May 31 and July 14, 1938; delivery dates February 1, April 11 and May 15, 1939.

Hulls Nos. 175-180, six single screw diesel cargo vessels, C-2 design, for U. S. Maritime Commission; equipped with Sun-Doxford engines. Delivery dates July 4, 1939; September 2, 1939; November 1, 1939; December 31, 1939; March 1, 1940, and May 1, 1940.

Hull No. 181, single screw steam turbo electric drive tanker for Atlantic Refining Co.; 521′ x 70′ x 40′. Delivery date March 1, 1940.

A New Line of Splash Proof Motors

Good engineering in design and construction characterize the new line of splash proof motors recently announced by the Diehl Manufacturing Company.

The frame is of sturdy cast iron construction.

All windings are especially impregnated with waterproof compound of high dielectric and insulating qualities.

An effective baffling system prevents the entrance of water or of any falling particles of matter.

A highly improved system of ventilation maintains a very low temperature rise in each part of the interior.

All bearings are of the sealed-ball type, accessible for lubrication in any mounting position but absolutely inaccessible to dirt or moisture.

Every motor in this line conforms to N. E. M. A. specifications for splash proof motors, and the line is complete to cover all N. E. M. A. sizes and ratings.

Trade Literature

List Price Schedule R1: The Lunkenheimer Co. has recently issued a new 44-page List Price Schedule which supersedes all previously published list prices. It covers the entire line of valves, boiler mountings and lubricating devices, which are listed numerically by figure number.

These schedules are available through Lunkenheimer Distributors in all industrial centers and from the company direct.

PACIFIC MARINE REVIEW

NOVEMBER, 1938

Steam up for American President Lines!

CHANTILLY *Lace*

NEEDS NO QUALITY "BUILD-UP

What has Chantilly lace got to do with products of the Marine field? Only this. Marine products must be of highest quality. And even an apprentice seaman could tell that such lace as this was made with infinite care and skill.

But not so easy to tell is the quality of some products used aboard ship. Particularly is this true of rope. Two ropes that look exactly alike may vary greatly in strength and in service.

That is the reason that operators of Pacific ships have learnt to depend upon rope trade names that they know represent *proven* performance. They know that when they specify Tubbs rope brands, they are specifying products behind which stand 82 years of rope making skill.

Assure maximum rope efficiency and lowest operating cost by insisting on these famous Marine rope brands—

TUBBS ROPE

SUPERCORE - - EXTRA SUPERIOR MANIL

TUBBS *Cordage Company*

200 Bush Street, San Francisco
Mills in San Francisco

PACIFIC MARINE REVIEW

OVEMBER, 1938

Official Organ
acific American
teamship Association
hipowners Association
f the Pacific Coast

Our Cover

As we go to press, word comes that Joseph R. Sheehan has changed the sign of the silver dollar on the flags and funnels of the President liners to an eagle. May we express the hope that this is prophetic of a tenfold increase in the business of the American President Lines!

Our Frontispiece

For this striking photograph of a full-rigged ship bow on and almost hull down behind a big swell, we are indebted to Mr. John Pruner of American-Hawaiian Steamship Co. She is said to be the Wm. G. Lewis. Can anyone give us particulars?

TABLE OF CONTENTS

Editorial Comment:

Pacific Coast Shipbuilding ... 21
Full Speed Ahead with American, Orient and Round-the-World Services ... 23
Pacific Coast Shipping ... 29
By Joseph R. Sheehan.
Your Problems Answered ... 30
By "The Chief."
Steady As You Go! ... 34
Some Notes on Cargo Hatch Covers ... 36
The Workboat Yacht Stranger ... 38
By Chas. F. A. Mann.
Senate Report No. 184 ... 41
By Comm. Howard L. Vickery.
Spunyarns and Catharpins ... 45
A New Variable Capacity Oil Burner ... 46
An Unusual Marine Forging ... 49
A Notable Marine Propulsion Turbine Record ... 50
Trade and Trade Notes ... 52A
Pioneer Sheet Metal Firm Moves to New Quarters ... 52B
On the Ways ... 53
Latest News from American Shipyards.

Safety on Shipboard:

Revision of Rules ... 56
Well-Deserved National Recognition ... 56
Use Your Goggles! ... 57
Building in American Yards ... 72

Miscellaneous: An Unusual Intercoastal Cargo, 32; World's Longest Chain, 33; Recent Changes of Masters, 35; Deck Officers' Licenses, 36; Fairbanks Morse Diesel Popular on Puget Sound, 40; Mackay Radio Exhibit, 44; New Light Weight Compact Arc Welder, 47; A New Plastic Cork-Rubber Flooring, 48; "John Crane" Glass Packing, 48; Boiler Performance on Tanker Associated, 51; Literature of the Industry, 55; A Piston Ring That Stops All Leakage at Cut, 70; Atlas Distributes Buda, 70; Prevents Weld Spatter Adhering to Metals, 70; Literature of the Industry, 76.

UBLISHED AT 500 SANSOME STREET . . . . SAN FRANCISCO

tered as second class matter June 20, 1913, at the post office, San Francisco, under the Act of March 3, 1879. Published on the 1st of each nth. Advertising and editorial forms close on the 15th. Subscription price, one year: Domestic, $1.50, foreign, $2.50; two years: Domestic, 50, foreign, $4.00; three years: Domestic, $3.00, foreign, $5.50; single copies, 25c. Chas. F. A. Mann, Northwest Representative, 1110 get Sound Bank Bldg., Tacoma, Washington. New York Office, Suite 404-405-406, Two Hundred Broadway, Telephone COrtlandt 7-3579.

New York City copies of Pacific Marine Review can be purchased at the news stands of I. Goldberg, 42 Broadway; Harry Nash, 17 Battery ice: Philip Mandara, Greenwich Street and Battery Place. In Washington, D. C., at the news stand of the Carlton Hotel, 16th and K Streets.

J. S. Hines
esident and Publisher

B. N. DeRochie
Assistant Publisher

Alexander J. Dickie
Editor

Paul Faulkner
Advertising Manager

F. Dryden Moore
Assistant Editor

PACIFIC MARINE REVIEW

VOLUME XXXV NOVEMBER, 1938 NUMBER 11

Pacific Coast Shipping and Pacific Coast Shipbuilding

The prosperity of the shipbuilding industry in any locality is directly dependent on the activity of shipping in that locality.

The activity of American flag shipping on the Pacific is now entering a period of replacement, rehabilitation, and expansion. Consequently, Pacific Coast shipyards are beginning to show signs of renewed activity.

This is evidenced in many ways: First, during the past two years the shipyards of the Pacific Coast have expended over $4,000,000 on modernization, retooling, and rearrangement of plant.

Second, during the same period at least two groups of American financiers have investigated various Pacific Coast sites with the idea of starting new shipyards.

Third, very recently the President of the United States is reported to be flirting with the idea of establishing U. S. Government-owned and operated shipyards for building merchant vessels on the Pacific Coast.

Fourth, several of the large Atlantic Coast manufacturers of marine auxiliaries, who had during the depression withdrawn their engineering representatives from the Pacific Coast, have reestablished such representation.

Fifth, the Pacific Coast Navy yards are spending large sums in improvements—building new shops, retooling, and installing much materials handling equipment. (Incidentally, this phase of shipyard improvement brought a nice $230,000 contract to the Moore Dry Dock Company for the fabrication and erection of steel for the new foundry building at Mare Island Navy Yard.)

Sixth, and most important of all, is the reorganization of the former Dollar Steamship Company under Joseph R. Sheehan, and the proposed building program for the replacement of the Dollar ships and other Pacific Ocean fleets.

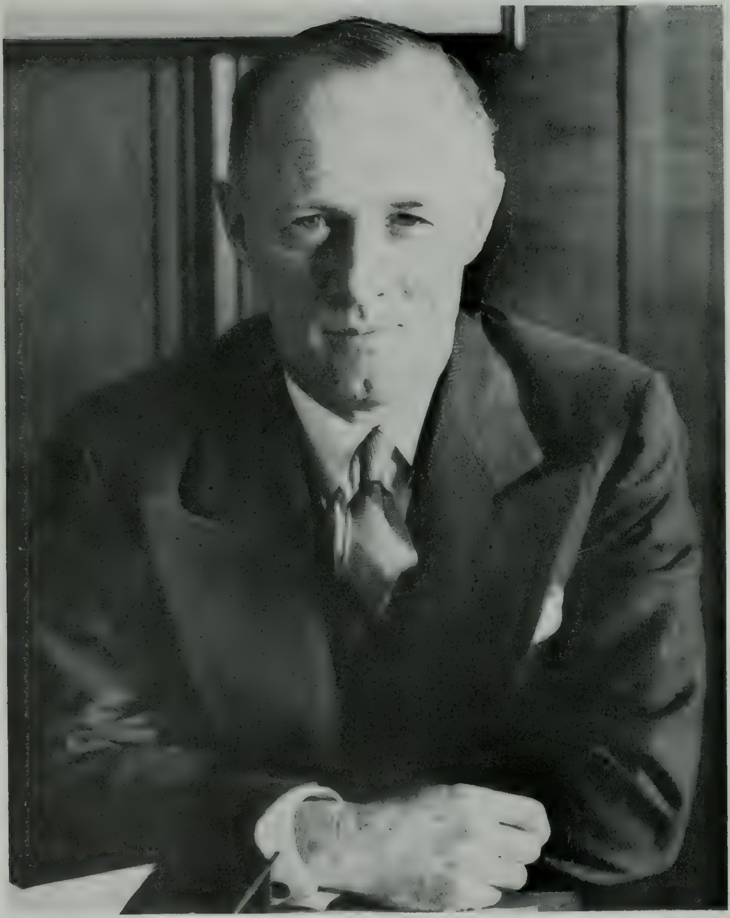
All of these factors and the known necessity for large replacements in coastwise and intercoastal shipping have combined to brighten the prospects for the immediate future of Pacific Coast shipbuilding.

Comparative cost of shipbuilding on the Atlantic and on the Pacific Coasts forms practically the only handicap. Against this the Pacific Coast has two advantages: a 6 per cent differential in bidding on ships to be used on the Pacific Coast, and a climate better adapted the year round for increased production from shipyard labor.

The 6 per cent differential hardly takes care of the freight on materials and machinery. The advantage of climate assures reality only as shipyard labor cooperates to the limit of its ability.

Labor derives more proportionate wage benefits in shipbuilding than in any other industry. Shipbuilding labor is receiving higher compensation on the Pacific Coast than in any other location in the world. Therefore labor should cooperate 100 per cent in making it possible for Pacific Coast shipbuilders to bid on shipbuilding contracts with the knowledge that the largest cost factor is a stable factor and not a wild variable.

Let's get started building Pacific Coast ships in Pacific Coast shipyards.



JOSEPH R. SHEEHAN

President, American President Lines

His job: The reestablishment of American flag services transpacific and round the world.

His slogan: American patronage for American flag ships.

Full Steam Ahead for THE AMERICAN PRESIDENT LINES ROUND THE WORLD

Alongside at Kobe.

By GENE HOFFMANN

Director of Publicity, American President Lines

We of San Francisco, sitting ser- ne, indifferent to fate by our Gate f Gold, are very prone to become ix in our duty as the "warden" of his gate and its influence over "two ontinents." But still, "The wild, erce freedom of the stubborn seas, eats in our blood," and ever and non we hear adown the dawn great destinies calling our courage" nd rise to them as to the throbbing f some distant drum.

One such memorable call came to us with the announcement of the Westward Round the World cargo service by that grim old Pacific Coast lumberman and shipowner, the late Captain Robert Dollar. Established with its home port and principal office in San Francisco, this organization maintained the first liner service circling the globe with clocklike regularity of schedule. This was an adventure to rouse the spirit of any sea-loving people, and San Francisco rose to acclaim the energy and the vision of the great adventurer who was its pioneer.

The name of Robert Dollar became a household word practically around the world. Under his guiding hand many younger executives were trained especially for this service and the Dollar Lines' personnel became known the world over for energy and efficiency in selling cargo and passenger space and in operating ships.

Through various causes and for reasons that need not be discussed here, the Round the World Dollar Line ceased to function. Its fine ship lay at anchor in the backwaters

The American President Lines' S. S. Coolidge at Kowloon.

Top: Arthur Poole, Vice President.

Center: W. J. Bush, V. P. in Charge of Operations.

Bottom: Oscar Steen, V. P. in Charge Oriental Operations.

of New York Harbor and San Francisco Bay. To San Francisco this was a great blow, not only in the economic aspect but a great blow to the spirit and pride of the city.

But today San Francisco is hearing again the voice of "great destinies calling her courage." In San Francisco and up and down the Pacific Coast the reaction is a new throbbing pulse of energy in the arteries of commerce and a new confidence in facing the future of Pacific Ocean shipping.

On every hand in San Francisco one meets evidences of this aroused outlook toward the sea. It is apparent: in the more optimistic tone of the press notices on shipping; in the more cheerful morale of the man on the street; in the heightened interest of manufacturers representatives; and in the programs of luncheon clubs and other organizations. This new voice avers simply and confidently:

"The Dollar schedule will be restored.

"The Round the World liners will again operate regularly out of San Francisco.

"The organization which has been responsible for filling these ships in the past will continue to function.

"The ships will be put into first class condition for operation.

"A definite program of replacement with new and better vessels will be put into execution promptly."

On this basis San Francisco shipping and San Francisco shippers look forward with hope in the future and with renewed energy in business.

The source of this new outlook—this awakened throbbing energy—is easily traced to the magnetic personality of a dynamic leader—a clear-eyed, square-jawed Boston Irishman with a fighting heart—Joseph R. Sheehan, president of the American President Lines, whose quick wit, "humor-lit face," and contagious confidence have won alike the loyalty of his associates and the hearts of San Franciscans.

In various speeches and press conferences, president Sheehan has laid the cards on the table with great frankness and has demanded cooperation from American shippers, exporters and importers, not so much from patriotic motives as from sound reciprocal business reasons. He realizes fully the magnitude of the task facing the reorganized Dollar Lines and does not for a moment minimize the difficulties, but is convinced that good business management backed by American shippers' patronage and Federal subsidies can achieve success.

Concerning his policies as executive of the American President Lines, president Sheehan has made many observations and press releases. These are summarized in the speech by him before the Propeller Club of California, an abstract of which will be found on page 29 of this issue of Pacific Marine Review.

The change of name for the Dollar Lines was given much consideration.

In commenting on the selection, president Sheehan said:

"Dollar ships are known around the world as 'President' liners. Each vessel was named in honor of an American president. Therefore it was felt that no name could be more fitting than 'American President Lines.' The word 'American' is included in the new name to give the ships flag identity.

"I am hopeful the public will approve our selection, and indicate that approval in a concrete way by continuing to patronize our ships. We are determined to operate them in a manner that will justify public confidence and support."

The favorite slogan of Joseph R. Sheehan is "American Patronage for American Ships." On this he comments:

"Consider the millions of dollars that go out from these shores annually in the form of freight and passenger tariffs paid foreign flag operators. That is your money that is leaving your community forever, to enrich the merchants and governments of other lands.

"Even if one be disposed to follow the belief that economics justifies shipping goods in the cheapest way, none of us is warranted in failing to aid in the employment of our citizens on board our ships. When the Dollar Lines were in full operation, their average annual expenditures for salaries and wages amounted to $3,209,125, and I don't need to tell you that much of this money was spent in Metropolitan Oakland, as it seems that most of our off-shore employees and a large number of our shore staff make their homes on this side of the bay.

"The business of shipping on the West Coast is so important to all the communities involved that it seems that it should be superfluous to stress the necessity of supporting it."

The full effect of the business brought to San Francisco and the Pacific Coast by the normal operation of the American President Lines can be accurately estimated from the experience of the Dollar Lines. In a normal year that organization would spend in this market:

For salaries and wages (Exclusive of stevedore charges)	$3,210,000
For stores and provisions	2,160,000
For dock labor	1,000,000
Engine room stores and fuel oil	1,200,000
Total	$7,570,000

In addition to these huge sums the Dollar Lines in a normal year brought into and took out of San Francisco some 30,000 passengers. It is conservatively estimated that these passengers would average expenditures of $100 while on the Pacific Coast, and this would add another $3,000,000 to the Pacific Coast economic benefit from the operation of these lines.

This huge benefit from American flag ship operation should be a clinching argument with the American business for the patronage of all American flag ships.

The schedule of the American President Lines will be practically the same as the former normal schedule for the Dollar Lines. It offers regular and frequent train-like schedules to the Orient and around the world, and west-bound Intercoastal.

Briefly, this provides weekly sailings from Los Angeles and San Francisco to the Orient, fortnightly sailings Round World and fortnightly sailings from Atlantic Coast ports. Inbound from the Orient, there will be a ship every two weeks Round World ships will arrive at two-week intervals at New York and Boston from the Mediterranean en route to California via the Panama Canal.

A feature of the new schedule is the addition of Yokohama as a port of call for vessels in the Round World service. Formerly they called only at Kobe in Japan.

Shanghai is still omitted in the new schedule. It was explained that the number of ships now available makes it impossible to enlarge on the old schedule at this time. In this respect the loss of the President Hoover is keenly felt. The company recognizes the importance of Shanghai and, according to president Sheehan, will do everything within its power to reinstate it on the schedule at the earliest possible moment.

All of the "President" liners are being reconditioned and redecorated with the view of making them conform to the most exacting demands of modern travel. Upwards of $2,000,000 is being spent by the new management for this work, and when finally turned out the "President" fleet will meet the highest standards of the Bureau of Marine Inspection and Navigation of the U. S. Department of Commerce, which, incidentally, are the most exacting in the world.

Refrigerated cargo chambers have been revamped and modernized with installation of the latest air-conditioned equipment, especially adapted to the carriage of fresh fruits and vegetables and perishables of all description.

Resumption of service to the Straits Settlement and India, it was

Top: M. J. Buckley, Freight Traffic Manager.

Center: Thomas E. Cuffe, Assistant Freight Traffic Manager.

Bottom: Hugh Mackenzie, Passenger Traffic Manager.

Around The World With American President Liners

PORTS OF THE SEVEN SEAS

Top: left, at the pier, Manila; right, passing into San Francisco Bay under the Golden Gate Bridge.

Center: left, on the waterfront at Honolulu; right, alongside at Yokohama.

Bottom: left, Naples, with Vesuvius in background; right, opposite the Bund at Shanghai.

pointed out, will be a great boon to shippers whose markets have been badly cramped by a lack of adequate cargo space.

First vessels to move under the new setup will be the President Adams out of Boston November 1, and from New York the 4th, and the President Monroe from San Francisco November 5.

Repairs and reconditioning on the fleet are being arranged to meet the schedule requirements. This program of rehabilitation will run into figures well over two million dollars, and many Pacific Coast and Atlantic Coast firms are greatly benefiting thereby.

Each of these vessels must be drydocked. On the dock her underwater body must be thoroughly cleaned of accumulated growths and then carefully examined for defects of structural plating, of propeller blading, of propeller shafts and their outboard bearings, and of the rudder and its appendages. All defects must be repaired to the satisfaction of the U. S. Bureau of Marine Inspection and Navigation and the American Bureau of Shipping. Then the bottoms are thoroughly painted with Germicide Anti-fouling paint, and the sides with Super Tropical Germicide Anti-fouling paint, both manufactured by the American Marine Paint Company. Super Tropical Germicide is especially compounded to kill grass on ships traveling in warm tropical waters. Chosen for consistent quality, these paints are scientifically formulated to withstand the pounding of the elements at sea and to lengthen the time between paint jobs.

After the jobs on underwater body are complete, the ship leaves the dry dock and goes to the outfitting wharf of the successful bidder on alterations, new equipment and machinery repairs. New regulations for safety at sea and for crew comforts are responsible for most of this class of work. Take, for instance, the President Taft. After drydocking and underwater work approximating $75,000 at the Moore Dry Dock Company she goes to General Engineering & Dry Dock Company, low bidder for an above-waterline and interior job approximating $100,000.

This includes the installation of electrically operated winches for handling the lifeboats, which was awarded to the United Engineering Company of San Francisco, who will supply and install Welin winches.

Rearrangement and refurnishing of crew's quarters is one of the big items.

Brick work in boilers will be repaired by J. T. Thorpe & Son, and renewal of insulation on pipe work will be done by the Western Asbestos Company, both of San Francisco. The necessary electric work will be installed by the Dahl-Beck Electric Co. of San Francisco. Another important item is the installation of a complete automatic sprinkler system for fire extinguishing in the passengers' and crew's quarters.

The President Taft had already been equipped with emergency radio loud speaking equipment made by the Remler Company, Ltd., of San Francisco.

On the President Monroe most of the work is being done by the Potrero Works of the Union Plant of Bethlehem Shipbuilding Corporation, Ltd.

All of the President liners have a considerable capacity for refrigerated cargo. As originally installed, the air circulation in the refrigerated chambers was not satisfactory. The Phillips Refrigeration Products Company of San Francisco was called into consultation for the cure of this condition. They have succeeded on several of the liners in completely correcting the trouble and giving good refrigeration throughout the chamber for the entire voyage.

This firm is now installing on the President Monroe a well-designed fan and brine coil combination which, by the aid of scientifically arranged baffle bulkheads and ducts, insures practically a uniform temperature throughout the chamber and its contents.

In all of the work on these vessels San Francisco manufacturers and firms have been given preference. Much of the actual work is being done in New York because several of the vessels were laid up in that port, but where possible all materials and equipment for that work have been ordered through San Francisco agents of the firms supplying the goods.

The Fleets

The ships involved in the American President Lines' services comprise at the present time 13 vessels. Six of these are in the New York-Pacific Coast-Asiatic service on a fortnightly schedule, and seven are

An American President liner outward bound from Havana harbor.

in the Round the World service on an alternating fortnightly service.

Flagship of the New York-Pacific Coast-Asiatic fleet is the President Coolidge, one of the finest and most modern passenger liners in the American Merchant Marine. Fitted with electric drive and capable of maintaing better than 20 knots at sea, this ship was at the time of her delivery the largest American merchant ship afloat, with a gross measurement of 21,960 tons. She is now topped only by the Manhattan and Washington.

The other five vessels on this service are:

	Gross tons
President Cleveland	12,568
President Lincoln	12,594
President Pierce	12,579
President Taft	12,562
President Wilson	12,579

These are fine, comfortable, twin screw ships driven by geared turbines of 12,000 shaft horsepower and capable of maintaining 18 knots sea speed.

On the Round the World service the seven ships to be operated are:

	Gross tons
President Adams	10,516
President Garfield	10,495
President Harrison	10,504
President Hayes	10,533
President Monroe	10,533
President Polk	10,500
President Van Buren	10,533

Each of these seven vessels is powered by engines of 6,000 horsepower and is able to maintain a sea speed of approximately 16 knots.

The aggregate gross measurement of these 13 ships is 158,456 tons.

Replacement plans presently to be executed call for three vessels of the President Coolidge type to run along with that liner in the New York-Pacific Coast-Asiatic service, and for seven vessels of the Maritime Commission modified C-3 type to replace the seven 10,500 gross ton, 16 knot vessels now being groomed for Round the World service. The total cost of these 10 vessels will approximate $50,000,000.

Organization

When Joseph R. Sheehan was appointed president of the Dollar Lines, now the American President Lines, he publicly made the statement, "Any organization that can maintain $16,000,000 worth of business through the depression is a good organization to keep. These executives stay on their jobs as long as they deliver."

Pursuant to that statement, the organization of the "American President Lines" comprises:

Joseph R. Sheehan, President.

Arthur Poole, Vice-President.

W. J. Bush, Vice-President in Charge of Operations.

Oscar Steen, Vice-President in Charge of Oriental Operations.

M. J. Buckley, Freight Traffic Manager.

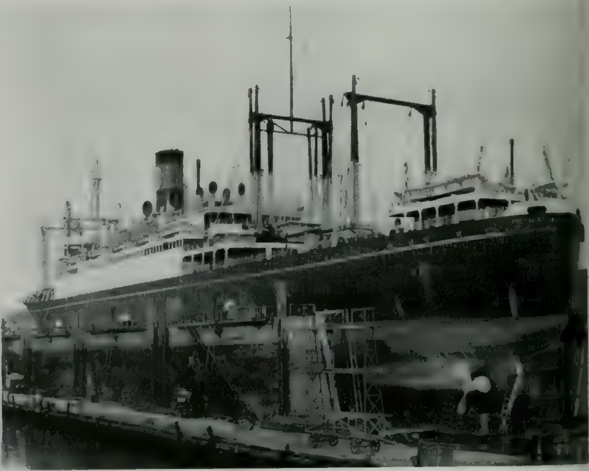
Thos. E. Cuffe, Assistant Freight Traffic Manager.

Hugh Mackenzie, Passenger Traffic Manager.

All of these men are working together for the building of a fine American flag service Round the World.

Joseph R. Sheehan is supplying the spark of confidence inspiring leadership. Arthur Poole is an efficient guardian and conserver of company funds. The others are all veterans each in his particular specialty, able to deliver, and each having under him a well-balanced organization of veterans forming a zone of business creating, business getting, American influence that girds this globe with the slogan:

Full Steam Ahead for the American President Lines.



All American President liners are being reconditioned and put in first class condition for service. Here are two views of S. S. President Taft on one of the floating docks at the Oakland plant of the Moore Dry Dock Company.

Pacific Coast Shipping

By JOSEPH R. SHEEHAN

President, Dollar Steamship Lines

The Maritime Commission could ot be more interested in Pacific oast shipping if every member ame from this area.

Unfortunately, however, there are wo obstacles in the way of development of West Coast shipping. ne is that economic laws are not lways influenced by geography. he other is the lack of authority on he part of the Maritime Commision to deal with some of the probems that are presented.

Shipping services between New ork and San Francisco have many f the characteristics of international shipping. Fuel costs are the same, vages are the same, port charges are he same, passengers expect the ame comforts, shippers look for imilar speeds; indeed, the main if ot the only difference is that in the ntercoastal trades there is no forign competition.

On the other hand, there is rail, us, truck, and air competition and, bviously, if intercoastal shipping is ver subsidized, all competing land ransportation would be justified, it eems to me, in demanding like reatment.

National Defense

There is another consideration, owever, that may eventually have decided bearing on this matter, nd that is the important question f national defense.

The Navy is now undertaking vhat is probably the greatest peace ime expansion in our history and hey have advised the Maritime ommission that the new and greatr Navy must be supplemented by 00 ships of the Merchant Marine, he vast majority of which must ave speeds of at least 16½ knots. ow the present foreign commerce hips that we have can be replaced y 300 ships of this speed. More han that number cannot be justified conomically. However, as merchant hips are almost as important as varships in an emergency, the Maritime Commission is planning to build 50 ships a year for the next ten years. Those other 200 ships must go into operation somewhere and possibly a plan can be worked out to place them in intercoastal and coastwise services without disrupting the economics of our whole transcontinental transportation systems.

As regards the second obstacle, viz., lack of legal authority, all I can say is that under the present law the Maritime Commission has no jurisdiction over shipping and domestic trade. I understand that coastwise shipping is in a rather deplorable state and the importance of domestic shipping to national defense is so great that it may be found eventually not only wise, but essential to assist it.

For purposes of national defense, ships which always remain in our own waters are more valuable than those in international trade, and the reason for this is obvious. The former are always in or near American waters, whereas the latter are subject to all sorts of hazards, such as destruction or seizure. Therefore, our country may some day consider the subsidizing of vessels in domestic trade, solely from the point of view of national defense.

Economic Importance

Water transportation, whether in foreign commerce, intercoastal or coastwise, or even that represented on our inland waterways, is mighty important to the economic life of the country, as well as to its defense. Therefore, the Maritime Commission is even now recruiting a staff of experts to make a thorough study of all phases of domestic water transportation, along lines similar to the economic survey of the ocean-going merchant marine which was published last fall. The former chairman of the Commission, Mr. Kennedy, stated in a speech made in San Francisco on January 7 of this year, that he would recommend that this study be undertaken. It is now about to be made and that part of it which deals with intercoastal and coastwise shipping may be completed by the end of the year.

The whole West Coast is greatly interested in the future of the American ocean fleets which will carry your foreign commerce. In this respect the Maritime Commission has definite plans which are being pushed to a conclusion with all the speed possible.

Ship Construction Program

The West Coast program calls for the construction of:

Three combination vessels of an improved Coolidge type which, when completed, will be used with the Coolidge in maintaining a fortnightly transpacific service;

Seven vessels of a modified C-3 design for operation in the round the world service. These ships will be of 16½ knots with about 10,000 deadweight tons, and with accommodations for about 60 passengers. These ships will make possible a fortnightly round the world service, and in combination with the transpacific vessels will give the Pacific Coast weekly sailings for both passengers and freight to the Orient;

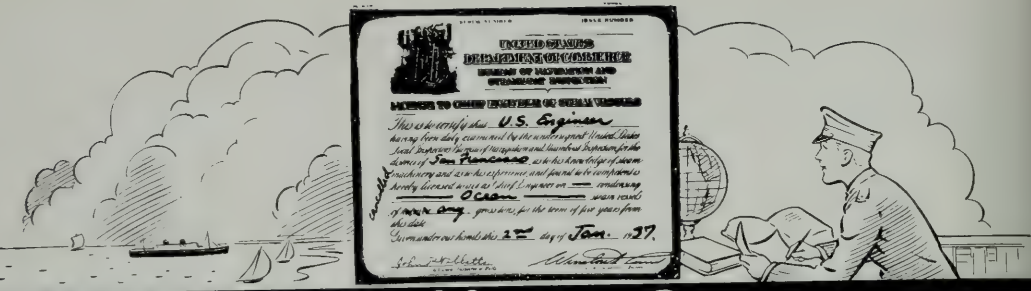
Four ships of a special design for operation between the Pacific Coast and the East Coast of South America. These ships will be operated by the Pacific Argentine Brazil Line;

Four C-2 ships, fast cargo vessels for operation from the Pacific Northwest to the Orient. These will be 15½ knot ships, of about 9,000 deadweight tons, and probably limited entirely to cargo;

At least 4 ships of the same type for operation between the Pacific Northwest and Europe.

This program involves the construction of at least 22 ships at a total cost of close to $100,000,000. I know you will be interested to

(Page 37, please)



UNITED STATES
DEPARTMENT OF COMMERCE
BUREAU OF NAVIGATION AND
STEAMBOAT INSPECTION

LICENSE TO CHIEF ENGINEER OF STEAM VESSELS

This is to certify that U.S. Engineer having been duly examined by the undersigned United States Local Inspectors Bureau of Navigation and Steamboat Inspection for the district of San Francisco as to his knowledge of steam machinery and as to his experience, and found to be competent is hereby licensed to act as Chief Engineer on — condensing — Ocean — steam vessels of any gross tons, for the term of five years from this date.

Given under our hands this 2nd day of Jan. 1937.

Cancelled

Your Problems Answered by "The Chief"

The word "Cancelled" was inscribed on face of the above license at the direction of the Bureau of Marine Inspection and Navigation. As used here it means "Specimen Copy."

Some Basic Considerations Regarding DENSITY and PRESSURE

So many questions arise involving an understanding of density and pressure and its effects that it seems desirable to devote an entire article to discussing this fundamental concept.

"The Chief."

WHAT IS DENSITY?

The density of the various gases, liquids and solids is the ratio of their weight to their volume. Density is usually expressed in pounds per cubic foot, or pounds per cubic inch. This would be called the **specific density.**

Quite frequently it is more convenient to express the same thing as a ratio of the weight of the substance to the weight of the same volume of another substance. This is called **relative density.** The usual substance to which gases are compared is air. For example, a cubic foot of carbon dioxide at 64° F. weighs .1156 lbs. A cubic foot of air at the same temperature weighs .0761 lbs. The relative density of carbon dioxide would therefore be equal to the former divided by the latter, or 1.520. Thus we see that carbon dioxide is over half again as heavy as air. Here we see why this gas settles into pockets aboard ship and is so dangerous to workers in enclosed spaces.

The relative densities of some common gases at 64° F. are given in the table herewith.

The substance to which liquids and solids are compared is fresh water. Water weighs 62.5 lbs. per cubic foot, or 8⅓ pounds per gallon. (For more accurate figures see accompanying table.) Thus a cubic foot of sea water weighs more than a cubic foot of fresh water by the ratio of 1.026, or 2.6 per cent more.

In the table herewith are set down the relative densities of some common liquids and solids as compared to fresh water.

WHAT IS BUOYANCY?

The principle of buoyant force was discovered by Archimedes (a philosopher and mathematician of ancient Greece) and was stated by him in the following law as: A body submerged in a fluid is buoyed up by a force equal to the weight of the fluid displaced by that body.

It is clear from this law that those substances having a relative density over 1.000 will sink in water and those having a relative density less

	Relative Density
GASES	
Oxygen	1.105
Hydrogen	.0696
Carbon Monoxide	.968
Carbon Dioxide	1.520
Ammonia	.590
Nitrogen	.970
LIQUIDS	
Alcohol	.789
Carbon Tetrachloride (Pyrene fluid)	1.594
Gasoline	.67
Glycerine	1.261
Petroleum Oil	.878
Sulphuric Acid	1.831
Water	1.000
Salt Water (Sea)	1.026
SOLIDS	
Aluminum	2.70
Copper	8.89
Gold	19.30
Iridium	22.42
Iron	7.87
Lead	11.34
Magnesium	1.74
Mercury	13.546
Nickel	8.85
Silver	10.5
Tin	7.29
Concrete (Average approximation)	2.25
Fire Brick	2.24
Coal	1.3
Glass	2.5
Quartz (Average approximation)	2.65
Rubber	1.0
Paper	.7 to 1.1
Wood (Varies widely)	.5
Ice	.922

than 1.000 will float. The buoyant force can only be equal to the displaced water. When relative density is less than 1.000 the material sinks only far enough to displace the amount of water required to equal its weight. Thus, ice has a R. D. of .922; 1.000 ÷ .922 = 1.0855 as the relative volume of ice compared with water. This volume is 8.55 per cent more than that of water and hence ice floats in fresh water with 8.55 per cent of its volume out of the water.

Comparing ice with salt water, we find that the R. D. of salt water is 1.026; 1.026 ÷ .922 = 1.112, or the relative volume of ice compared with salt water. Hence ice floats 11.2 per cent of its volume above the sea water.

Archimedes, the Greek philosopher, proved to the king that his goldsmith was cheating him, by weighing the object supposed to be gold while suspended in water, then in air. He thus measured the density of the object and found it less than 19.3, which proved that the gold had been alloyed with base metals.

WHAT IS PRESSURE?

A cubic foot of fresh water weighs, at 39.1° F., exactly 62.425 lbs. If this sits on a smooth flat surface, the area of the surface would be 1 square foot, or 144 square inches. The weight on each square inch would be 62.425 ÷ 144 = .4335 pounds.

This is a pressure and represents the force on each square inch. If two such cu. feet stood one on top of the other the force would be twice as much. We thus can say that water pressure increases with the height of the surface of the water above the point under consideration.

SPECIFIC WEIGHT OF WATER

Tem. F.	Weight of 1 Cu. Ft.
32 degrees	62.41 pounds
40 "	62.42 "
100 "	61.99 "
212 "	59.82 "
300 "	57.41 "
400 "	53.62 "
500 "	48.78 "
600 "	41.49 "
700 "	25.38 "

Every foot of height adds .4335 lbs per sq. inch. Thus 100 feet depth shows a pressure of 43.35 lbs. per sq. in.

For salt water the figure would be 1.026 x .4335 = .44477. This is the constant used by deep sea divers to convert depth to pressure. It varies slightly with temperature.

The effect of temperature on the volume of water, hence its weight and density, is shown in a table herewith.

DOES DENSITY AFFECT THE GAGE GLASS READING?

If the water in the glass of the boiler were at a different density than that in the drum the gage would not indicate the true level. Two factors might affect this: (1) the presence of many bubbles of steam in the drum gives the water an effective density less than normal; (2) the drum water will be hotter than the glass water because of some cooling effect. Both of these causes lead to the same effect and same direction, hence there may be a noticeable difference; the gage water being of a greater density will not have to be as high as the drum water to balance it.

Incidentally, the gage water will not be as cool as some may suspect and as is often thought. The space above the gage water is steam at boiler pressure, hence at boiler temperature. Any cooling only draws more steam over to keep its temperature up.

Condensing to water which runs down the gage to return keeps the gage water quite hot, very close to boiler temperature.

WHAT IS THE BAROMETER?

The gage glass, the barometer, the mercury U tube, the draft gage, all are devices for balancing the weight of a column of air or water or other substance against a column of mercury or water or other standard.

For instance, suppose mercury, having a relative density of 13.546, were put into the U tube or a pair of gage glasses connected together at the bottom, and water poured into one arm of the system. The weight of the water will force the mercury level down on its side, thus up on the other side. If water is put in until the difference in level of the two surfaces of mercury is 1 inch, we will find that the difference in level of the two surfaces of water, the height of the water column, will be exactly 13.546 inches. Thus for a barometer of 30 inches of mercury we would have 30 x 13.546 ÷ 12, or 33.84 feet. Thus we would need a water column over 33.84 feet high to be used as a barometer. One inch of mercury is equivalent to 1.128 feet of water.

Since one foot head or height of water gives .4335 lbs. per sq. in., an inch of water in the draft gage is .036 lbs. per sq.in. pressure. Thus for low pressures such as used in draft of furnace or ventilating fans, the height of a water column in inches is used instead of pressure in lbs. per sq. in.

The draft of the furnace in natural draft installations is due to the difference in density of the hot gases going up the stack and the cooler gases in the engine room. In a later article, under boilers, we will discuss methods of calculating this draft.

IS THE STEAM GAGE AFFECTED BY THESE FACTORS?

The steam gage of a boiler reads the pressure in the steam drum, but for very accurate work these readings should be corrected for the height of the water column between the steam drum and the bottom or mud drums; also for the water column on the gage as used.

The gage is calibrated to read the pressure on it at its connection. If the point of attachment to the boiler is 10 feet above the gage a column of water 10 feet high stands over the gage. This means 4.34 lbs. pressure on the boiler less than the gage reads. This is a minus or negative correction. Incidentally, the pressure in the boiler at the height of the gage is read correctly by the gage. If we use the height of the gage as a point of reference, we may say that the pressure in the boiler is more or less than the gage reading when the point in question in the boiler is below or above the level of the gage. The correction will be .434 lbs. per sq. in. for each foot, adding if below, subtracting if above.

This is true only when making

the hydrostatic test. When steaming, the water in the boiler is not only steam hot but full of steam bubbles and much less dense than the water in the column above the steam gage, which may be quite cold. Furthermore, the point of connection of steam gage may be at the steam space, so that the condition is different than during the hydrostatic test.

When steaming, the steam pressure is lower than the gage reading by .434 times the height of the water column above the gage. The pressure in the mud drums will be more than the steam pressure by the height of the water in the water glass above the mud drum, multiplied by a constant determined by the temperature (see table) and rate of steaming.

Our next article will discuss gage and atmospheric pressures, vacuum and related subjects, as pertaining to condensers.

A REMINDER

A memory expert, at the close of a lecture, was somewhat exasperated at the volley of questions fired at him by the audience. Finally an old lady asked him to what he attributed his remarkable memory.

"Well, madam," said he, "when I was in the Air Force I once had to make a record parachute jump from a height never before attempted. Just as I jumped from the plane the pilot leaned over the side and yelled, 'Hi, you've forgotten your parachute.'

"Believe it or not, lady, that taught me a lesson, and I've never forgotten anything since."

Engineers' Licenses

The following list shows the licenses granted during the month of September to engineer officers of the merchant marine at Pacific Coast offices of the Bureau of Marine Inspection and Navigation:

SAN FRANCISCO

Name and Grade	Class	Condition
Elzie I. Carter, Chief Eng.	OSS, any GT	O
Fred Stacher, Chief Eng.	OSS, any GT	RG
Nick Athens, 1st Asst. Eng.	OSS, any GT	RG
Lynton I. Jordan, 1st Asst. Eng.	OSS, any GT	RG
David J. McBride, 1st Asst. Eng.	OSS, any GT	RG
Morris W. Nichols, 2nd Asst. Eng.	OSS, any GT	O
Dick Auyong, 3d Asst. Eng.	OSS, any GT	O
Benjamin H. Crichton, 3d Asst. Eng.	OSS, any GT	O
Elzie I. Carter, Chief Eng.	OMS, any GT	RG

SEATTLE

Name and Grade	Class	Condition
Herert I. Chatterton, Chief Eng.	OMS, any GT	O
Robert L. Hayden, 2nd Asst. Eng.	OSS, any GT	RG
Asa W. Radford, 3d Asst. Eng.	OSS, any GT	O

PORTLAND

Name and Grade	Class	Condition
Charles E. T. Jasper, Chief Eng.	OMS, not over 500 GT	O
Carl A. Green, 1st Asst. Eng.	OSS, any GT	RG

HOQUIAM

Name and Grade	Class	Condition
Walter E. Snell, Chief Eng.	OSS, any GT	O
Lewis G. Brower, 1st Asst. Eng.	OSS, any GT	O

SAN PEDRO

Name and Grade	Class	Condition
Elmer W. Westfall, 1st Asst. Eng.	OSS, any GT	RG
Richard H. Molsby, 3d Asst. Eng.	OSS, any GT	O

Abbreviations: GT is gross tonnage; RG is raised grade; O is original license; OSS is ocean steamer; OMS is ocean motorship.

An Unusual INTERCOASTAL CARGO

The first large parts for the mounting of California Institute of Technology's giant 200-inch telescope have started their 5,000-mile journey by rail, water and tractor-trailer to Mt. Palomar, California. This 200,000-pound shipment included the south end cross member, bearing box girder and smaller sections of the telescope structure.

These parts, which have been completed in the South Philadelphia Works of the Westinghouse Electric & Manufacturing Company, were taken from the plant by rail to Eddystone and there loaded aboard the freighter American Robin of the McCormick Steamship Company.

The south end cross member is the largest and heaviest single unit of the telescope structure. As big as a freight car, it is 46 feet long, 10 feet wide, 12 feet high and weighs 90,000 pounds. It forms the south section of the yoke that will support the huge mirror tube and will rotate on the Polar Axis of the telescope.

The other major unit of the shipment is the bearing box girder. This piece carries the thrust of the bearing at the south end of the Polar Axis and will be subjected to a load of 325 tons when the telescope is completed. It is 21 feet long, 8 feet wide and 11 feet high and weighs more than 70,000 pounds.

Supported by heavy brackets within the girder are three steel "bearing shoes" each three feet square. These curved shoes, faced with babbitt metal, support the ball-shaped south bearing of the huge Polar Axis, on which the telescope wheels from east to west, following the stars. Each shoe carries a load of 320,000 pounds.

South end cross member of Mount Palomar telescope structure on deck of the McCormick freighter Robin Adair.

From Philadelphia the parts will g southward, through the Panama Cnal, and around the coast to San Iego. They will be unloaded there c big trailers hauled by tractors, d will be carried 60 miles to the tp of Mt. Palomar, partly on the gaveled and oiled road built up the ountain by the County of San Iego. This road is thirty feet wide, th 100-foot curves, and is designed t permit automobiles to make the tp of the mountain in high gear.

The remaining parts of the mounti, including the telescope tube, ngs, cage and horseshoe bearing, ll follow the same route in two sparate shipments handled by the Veyerhauser Steamship Company d the American-Hawaiian Steamsip Company. Shipping schedules fom Philadelphia have been arnged so that the various pieces ll arrive in California in the prop- e sequence required by construction ork at Mt. Palomar.

Completion of the mounting is regrded as one of the most spectacul feats of engineering of recent tnes. The complete structure will vigh about 1,000,000 pounds. It ll be so delicately balanced that a half-horsepower Westinghouse otor will turn it on the declination axis. Yet it is so ruggedly built that an earthquake will not harm it.

Observers will ride not only in the nose, where photographs will be taken at the Prime Focus, but also in one arm of the massive yoke, which is so large that a complete spectrographic laboratory will be fitted up inside it, ten feet high and more than twenty feet long. This laboratory, equipped with a rolling stairway that will always automatically right itself as the telescope moves from east to west, will receive the light after it has been reflected and focussed by four mirrors.

The tube of the telescope, which will house the 200-inch mirror, is 44 feet long, or about as high as a four story building. It was completed in the spring of 1937, then taken apart and crated for shipment. It will turn on the declination axis, comprising a spindle at each side carried in ball bearings in the yoke, and two ingenious gimbals fitted into the east and west panels of the tube. These gimbals are shaped like double bicycle wheels, with the spokes arranged in two cones radiating from a common center, each spoke being tightened with a tension of 3000 pounds. The spokes give great rigidity radially, but can bend slightly, so that the gimbal acts like a universal joint and thus prevents strains from being transmitted to the tube and affecting the position of the optical axis.

The telescope will probably be in operation in 1940.

World's Longest Chain

To protect transatlantic cable service from interruption, especially at points offshore where the cable might be exposed to damage from fishing trawlers, engineers of the Western Union Telegraph Company have developed an ingenious device which digs a trough in the ocean bed and lays the cable in it. The "plow" weighs 10½ tons. Although 2,000 feet is the maximum sub-surface depth at which plowing is done, a line was required 4,200 feet long to allow paying the plow out from the cable-laying ship at an angle of 22° from the horizontal.

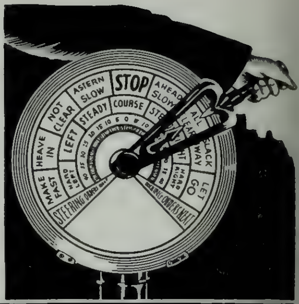
This line had to be capable of withstanding a load of at least 65,000 lbs., and as light and flexible as possible to permit handling by the cable ship with its regular equipment.

But ordinary chain would be far too heavy and cumbersome for this job. To withstand the proof load of 65,000 lbs., a crane chain of carbon steel would have to be at least 1½" in link size, which would make the length of 4,200 feet weigh at least 95,000 lbs., a dead weight exceeding the proof strength. Hence, if chain were to be used, it had to be made of extra strong material. After extensive experimentation, "Di-Lok" 3½ per cent nickel steel chain, was selected.

The completed chain had to be manufactured in one continuous length instead of in the 90-foot lengths common in marine chain work, because the usual detachable connecting link would impede smooth flow over the sheaves in unwinding. It is not the longest chain ever made, but by far the longest fabricated in one continuous operation. It weighs only 43,000 pounds, each link weighing slightly less than 3½ pounds. Heat treated to a hardness of 300 Brinell, it showed an ultimate strength of 117,000 lbs., and withstood a proof load of 84,000 lbs.

Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A DEPARTMENT FOR DECK OFFICERS

DAMAGE TO CARGO AND TO SHIP

by Improper Vertical Distribution of Weights

Rolling, or movement of the vessel from side to side, often results in damages to the ship's hull and to the contents of the hull. Since rolling can be controlled in part by the distribution of cargo weights it is important that every deck officer on merchant vessels should understand its causes and be fully acquainted with the means by which it can be controlled.

There are two distinct problems involved in the control of the rolling of a ship at sea. First and of primary importance to the safety of ship and contents is the problem of maintaining stability. Second, and of great importance in minimizing cargo damage and maintaining passenger comfort, is the problem of controlling the amount and the speed of the roll.

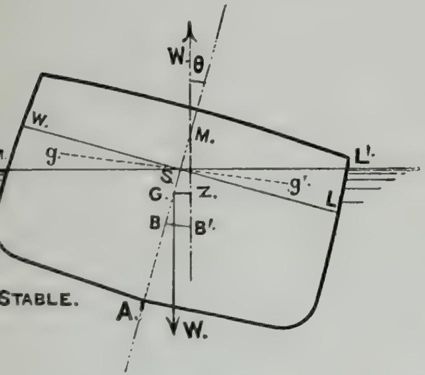


Fig. 1

Let's look into the simple fundamentals of these two problems.

I Stability

Stability is defined as the measure of the power of the ship to right itself when rolled or heeled to one side by some external force. In discussing this subject we will use terms that require definition as follows:

Center of Gravity is that point in the ship through which acts the resulant force due to all the weights of the hull and its contents.

Center of Buoyancy is the point through which acts the resultant force due to buoyancy. It is the center of gravity of the immersed portion of the hull.

Metacenter is the point of intersection of vertical lines drawn through the center of buoyancy at its various positions due to slight (up to 15°) roll of the ship.

Metacentric Height is the height of the metacenter above the center of gravity. This is always expressed as a negative distance when center of gravity is above metacenter.

Fig. 1 represents the transverse section of a ship steadily inclined at a small angle from the upright by some external force, such as the wind. The vessel has the same weight as she had in the upright condition and hence the same volume of displacement. If no weights on board have shifted the position of the center of gravity remains in the same position with reference to the ship's hull. Although the total immersed volume remains the same as that for the upright position there is a change in the shape of this volume, and consequently the center of buoyancy will shift its position in the immersed portion of the hull.

In Fig. 1 the position of the center of buoyancy for the upright condition is indicated by the letter B, and its position for the inclined condition by the letter B'. If now we draw a vertical line through B' it intersects the vertical center line of the hull at a point M, which gives us the position of the metacenter.

This diagram shows two equal

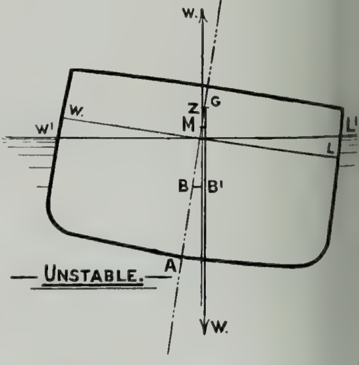


Fig. 2

rces acting on the ship. These are: t. The ship's weight acting ver-cally downward through the center gravity.

2nd. Buoyancy acting vertically ward through the B′ position of e center of buoyancy. Since these o forces are acting on separate rtical lines they form a couple. A e drawn through the center of avity G and perpendicular to the e B′-M gives us the distance -Z, which is the arm of this couple d is termed the **righting lever.** his diagram represents a ship in a ndition of positive stability or able equilibrium, namely, with the etacenter above the center of grav-.

Fig. 2 is a similar diagram for a ip in a condition of negative sta-lity or unstable equilibrium. Here e have the position of the meta-nter below that of the center of avity, and it is plainly shown by e diagram that this gives to the eight of the ship a tipping lever nger than the righting lever it ves to buoyancy.

Since buoyancy and weight are ual this longer lever gives weight e advantage and enables it to con-nue the tipping process to the int where the center of gravity mes below the metacenter. In mple words, weight under these nditions causes the hull to upset turn turtle.

From the above it is gathered that ould M be above G the ship is in stable condition; if M and G or e metacenter and the center of avity coincide, the ship is in neu-al equilibrium; and if M is below , the ship is unstable.

Ordinarily when M is well above the vessel is said to be "Stiff," d the further M is above G the ore this condition increases; and M is above and close to G the ves-l is termed "Tender" or "Cranky," d as the height of M above G de-eases this condition becomes more arked.

The height of the metacenter is ntrolled largely by the beam of a ssel and therefore it cannot be anged to any extent by stowage cargo.

The change in the center of buoy-cy is primarily dependent upon the freeboard of a vessel. The greater the freeboard the more it will change position at a given inclination, therefore the greater the freeboard the better the stability, all conditions being equal. But increase in freeboard can go too far, because, as it increases, the center of gravity rises in most cases, and raising the center of gravity decreases the stability.

Ships are prevented from reducing their freeboard past a certain limit by the load line, thereby controlling the center of buoyancy when fully loaded. When in a light condition or with the maximum of freeboard it is the center of gravity which rises to a point of possible danger. Ship architects and builders are careful to see that vessels are stable in a light condition. The only difficulty being that the ship may not have fuel or water in the bottom tanks, no cargo or light cargo in the lower hold and the upper decks filled with cargo or containing cargo with extraordinary weight; in this condition some ships will be unstable.

Changing the position of the center of gravity is the most important method of changing a ship's stability, and the method that is most under control of ships' officers. The position of the center of gravity depends largely on the disposition of cargo, fuel, water and stores. If the weight is low in the hull, the center of gravity will be low, the righting lever long and the stability will be assured. If the weight in the hull is high the center of gravity will be high and the stability reduced.

The greater the righting force of the ship, the more powerful and rapid will be the righting movement. With a large righting force the ship will be carried beyond the upright position and will regain it only after a series of rolls from side to side. A "Stiff" ship or one with a long righting lever, will therefore roll more rapidly and more violently than a "Tender" ship, or one in a less stable condition.

There are two ways to prevent excessive rolling: first, by moving the weights as far from the center of gravity as possible, but to move a weight downward would increase

RECENT CHANGES OF MASTERS

Marine Exchange, San Francisco

Steamer Alabaman: J. L. Thomsen; vice, Lester C. Hansen.
Steamer W. S. Miller: J. S. Christenson; vice, J. S. Engs.
Steamer Nebraskan: J. B. Knowles; vice, W. M. Strong.
Steamer Columbian: O. Lee; vice, H. B. Hansen.
Steamer Mapele: C. W. Saunders, Jr.; vice, W. J. Norberg.
Steamer Floridian: O. L. Thomson; vice, F. M. Scorah.
Steamer Point Palmas: G. T. Nielsen; vice, E. J. Wenzel.
Steamer Lake Miraflores: C. V. Hylander; vice, George O. McGrath.
Steamer Paul Shoup: F. W. Rosvally; vice, O. E. Lilly.
Steamer Kewanee: O. E. Lilly; vice, F. W. Rosvally.
Steamer K. R. Kingsbury: S. C. Sullivan; vice, C. Baker.
Steamer Washingtonian: C. T. Gaidsick; vice, D. H. Haseell.
Steamer Nebraskan: W. M. Strong; vice, J. B. Knowles.
Steamer Mauna Loa: W. R. O'Brien; vice, F. M. Graham.
Steamer Floridian: F. M. Scorah; vice, O. L. Thomsen.
Steamer Harpoon: John V. McKown; vice, J. Vandegeer.
Steamer Lake Miraflores: George O. McGrath; vice, C. V. Hylander.
Steamer Arkansan: B. Leep; vice, P. A. Jones.
Steamer J. A. Moffett: J. Orlando; vice, H. O. Bleumchem.
Motorship H. T. Harper: L. C. Hansen; vice, O. Baker.

the stiffness and increase rolling; by raising the weight the rolling is reduced and at the same time the righting leverage is reduced and the stability is also reduced; the only other movement of weight is horizontal or out in the wings of the cargo hatches. This tends to reduce rolling, but not to any great extent.

The only efficient method of reducing rolling is by decreasing the righting leverage and at the same time reducing the stability of a vessel. Most passenger vessels are built with a reduced metacentric height which is compensated for by a broad beam, which increases the righting leverage at large angles of inclination. Care must be exercised in reducing rolling by raising the center of gravity, especially in vessels with a narrow beam, to see that the metacenter and the center of gravity are kept in the proper relation to one another, insuring stability.

Some Notes on Cargo Hatch Covers

Hatches are openings through the decks of ships for the purpose of giving access to spaces below those decks. Cargo hatches give access to cargo spaces. Cargo spaces must frequently be loaded or discharged and consequently cargo hatches must be covered with portable, easily opened covers.

In steel ships it is possible to make large openings for cargo hatches. To facilitate cargo loading and discharge the tendency has been to make these openings as large as possible without sacrificing the strength of the ship structure.

The traditional method of covering cargo hatches is with hatch boards supported by strong backs. These boards at sea are covered with a waterproof canvas tarpaulin to keep out the weather and the sea.

Much ingenuity has been expended in improved hatch boards, improved strong backs, and improved methods of securing tarpaulins.

There is, however, an inherent danger in this method of covering hatches, and this danger increases very rapidly with the increase in size of the hatch. This danger lies in the lack of unity in such hatch covers. The boards, the strong backs, the tarpaulins, are all separate entities, each of which must be removed and replaced and set correctly each time the hatch is worked.

In consequence of this lack of unity it is more or less common practice to partially cover hatch openings when moving the ship in port and to throw the tarpaulin over the partially covered hatch.

Experience at sea also proves that such covers are often a source of danger to the cargo and sometimes to the vessel herself in heavy weather.

The costs of handling hatch boards and strong backs is part of the cost of stevedoring, and the high hourly cost of longshore labor is concentrating the minds of ship operators on this hatch cover problem.

C. Ralston True, superintendent of the Engineering and Safety Division of the Fireman's Fund Indemnity Company, in a paper read before the Western Safety Conference at Los Angeles September 14, has much to say about the dangers of wooden hatch boards and the benefits to be derived from changing to steel covers. The following paragraphs are quoted from this paper

"Since the year 1928, available casualty lists show forty ships foundered on the seven seas in that

Deck Officers' Licenses

The following list shows licenses granted during the month of September to deck officers of the merchant marine at Pacific Coast offices of the Bureau of Marine Inspection and Navigation:

SAN FRANCISCO

Name and Grade	Class	Condition
Hugh Brown, Master	OSS, any GT	RG
Valdemar Campbell, Master	OSS, any GT	RG
Arthur D. Cross, Jr., Master	OSS, any GT	RG
Leland E. Cudahy, Master	OSS, any GT	RG
Dennis S. Holler, Master	OSS, any GT	RG
Richard J. Raymer, Chief Mate	OSS, any GT	RG
Bernard E. Schultheis, Chief Mate	OSS, any GT	RG
Werner W. Wagener, Chief Mate	OSS, any GT	RG
Charles G. Wertz, Chief Mate	OSS, any GT	RG
George B. Cardew, 2nd Mate	OSS, any GT	RG
Cyril W. Hayes, 2nd Mate	OSS, any GT	RG
Henry E. Pasquale, 2nd Mate	OSS, any GT	RG
Harold R. Wood, 2nd Mate	OSS, any GT	RG
Robert L. Bigler, 3d Mate	OSS, any GT	O
Lawrence B. Myhre, 3d Mate	OSS, any GT	O

SEATTLE

Name and Grade	Class	Condition
Alexander Jensen, Chief Mate	OSS, any GT	RG
Lawrence E. Wedlund, 3d Mate	OSS, any GT	O

PORTLAND

Name and Grade	Class	Condition
Viggo V. Hansen, Chief Mate	OSS, any GT	RG

SAN PEDRO

Name and Grade	Class	Condition
Peter H. Denie, 2nd Mate	OSS, any GT	O
William W. Lotsey, Chief Mate	OSS, any GT	RG

Abbreviations: GT is gross tonnage; RG is raised grade; O is original license; OSS is ocean steamer; OMS is ocean motorship.

eriod, due to wooden hatch covers eing stove in during stormy weaner, it being estimated that, as a nsequence, 500 seamen of all naonalities lost their lives. During is period 115 ships reported cargo amage due to losing wooden hatch vers from stress of weather, nong which was the American ship eviathan, which had her weather eck hatch covers carried away by eavy seas.

"In the operation of an eight atch cargo ship of the type comon in the intercoastal service, we nd that ship crew and stevedores e exposed to a real personal acci ent hazard in the handling of 121 eel strong backs and 1094 wood atch boards, the hatches ranging in ze from 24 x 24 feet to 24 x 36 et; hatch boards being of unusual ze and weight.

"The element of lost time involved this obsolete equipment, not to ention the serious accident hazard the personnel on one line of ships 1930, showed $1,500,000 a year as spent in unproductive labor andling and rehandling hatch covs, including insurance charges for cidental injuries.

"In addition to the further disadntages of wooden hatch covers is e cost of maintenance, which nges from $1500 to $3000 per an m per ship. Some idea as to the agnitude of monetary loss, due to productive hand handling of pres t hatch equipment, is revealed in e statement that the tonnage of tch covers and strong backs haned in ships in our major seaports, presents 10 per cent of the total rgo tonnage handled.

"It is interesting to note that statics of the Federal Compensation mmission, for a five year period ding the year 1934, reported 69,1 lost time stevedoring accidents all ports in the United States. f this total, 7742 accidents inlved strong backs and hatch cov s, the average cost in medical aid d compensation paid being $332.72 r accident. On this basis, the sum $2,258,000 was paid by shipowns for this type of accident over the e year period, and it is believed at the proportionate accident ratio 36 per cent, for this type of accint in the stevedoring industry, may also be reflected in the insurance indemnities paid for injuries to seamen for similar accidents."

Bringing this matter more closely home to Pacific ship operators we have the report of the Accident Prevention Bureau of the Waterfront Employers' of the Pacific Coast. This report shows that in 1937 there were "94 longshoremen involved in accidents causing personal injuries while handling hatch covers and 54 per cent of these accidents resulted in injuries causing loss of time."

Pacific Coast Shipping

(*Continued from Page 29*)

learn that the present construction program of the Commission will involve 50 ships which are now either actually under construction or contracted for and 65 more which are included in the requirements made of operators as conditions of their operating subsidies.

The plans for the Coolidge type of ship have been on the drawing boards of the Commission for about five months and are well under way. The plans for the modified C-3 for round the world service are almost finished, the Commission has already asked for bids on the regular C-3's which bids are returnable this month, and 20 of the C-2's are already under construction or contracted for.

Pacific Coast Construction

I hope that Congress will soon permit the allocation of definite percentages of Maritime Commission construction to the West Coast and to the Gulf area and, indeed, Mr. Kennedy recommended such a course to the House Committee on Merchant Marine and Fisheries. It is apparent that there is a tremendous advantage in having our building and repair facilities well distributed over the three coasts.

There is no question but that we are headed for the greatest peacetime building program in our history and a well rounded plan should result in the placing of considerable work in West Coast yards. This coast is 3,000 miles long. Military, as well as commercial considerations make it mandatory that there be available a strong construction industry on these shores, even though it may cost more. There must be yards here that can build as well as repair both merchant and naval vessels. If anything ever happened to the Panama Canal, we here would be 13,000 miles away from the Atlantic seaboard. Our national security demands that we not depend on fate but that we be as well equipped here as on the Atlantic.

National Cooperation Needed

I desire to touch upon but one other item, and that is the attitude of the American shipper and traveler toward our Merchant Marine. There really is too much indifference toward it, for what reason I do not know. The fact is, however, that American ships too frequently receive no more consideration than do foreign flag vessels and the answer is not always to be found in the statement that American ships have not been and still are not as fast or as comfortable as foreign vessels. Too frequently cargoes are dispatched and passengers booked on foreign vessels when there is no commercial advantage to be gained.

The operations of the United States Lines, United Fruit, Matson, Grace Companies and other ship operating companies show that Americans know how to run ships.

The reestablishment of an American Merchant Marine is assured. You may count on that. Whether it will eventually be Government owned and operated, Government owned and privately operated, or privately owned and operated I do not know. That will depend on circumstances. I hope that the last named will be the case, and I firmly believe that if the American shipping and traveling public will give its wholehearted support to its Merchant Marine it can be made profitable enough to encourage the investment of private capital so badly needed today.

Abstract of address delivered before the Propeller Club of California.

The Workboat Yacht *Stranger*

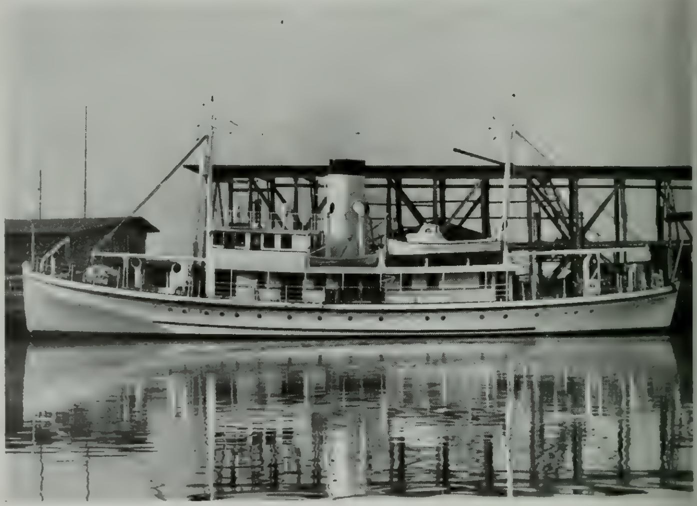
An Unusual Craft Built by Lake Union Drydock and Machine Works for California Owner

By CHAS. F. A. MANN

Designed by L. E. Geary of Los Angeles for Capt. Fred Lewis, Los Angeles capitalist and rancher, the rather unique pleasure-workboat Stranger has been completed at the Lake Union Drydock and Machine Works in Seattle and is away on her maiden voyage to Los Angeles and Honolulu, her registered home port.

Seventh in the line of widely assorted vessels all bearing the name Stranger, the latest to bear that name is one of the most unusually equipped private vessels ever built in America. Of unusually heavy wood construction, and built of timbers treated to be virtually rot proof, the vessel has the following principal dimensions:

Length	135 feet
Beam	22 feet, 8 inches
Draft	13 feet, 5 inches
Depth	16 feet, 4 inches
Gross	297 tons
Net	202 tons



Yacht Stranger at her builders' outfitting dock. Note large sheer and graceful lines of hull.

Virtually a double-ender above the water line, the Stranger is constructed largely of yellow cypress. Double sawed cypress frames are used, double planked with Douglas Fir below the waterline and cypress above. She is divided into five watertight compartments and is of exceptionally deep construction. A 90-foot lead shoe weighing 15 tons is fitted to the keel. The deck arrangement gives her a large amount of working space on all decks, as the drawings herewith show.

Six months' food stores are carried in a 6-ton capacity chill room and a 10-ton cool room, both placed forward of a trunk hatch extending to a small dry stores freight hold, in space normally occupied by the crew's quarters in the forecastle. These two refrigerated chambers and a large galley food box of conventional design are served by five large Frigidaire systems, located on the forward part of the machinery flat in the engine room.

Crew's quarters for 10 are ararranged between the machinery space and the cold stores, including ample locker and toilet facilities.

The machinery space houses an elaborate collection of special equipment. Electric converting generator sets for the Sperry Gyro Compass, radios, searchlight, and Kolster Radio Direction Finder are packed in on one side of the forward machinery flat. On the left side is an automatic hot water heating system, a Wesix domestic hot water heating system, two Briggs oil clarifiers for keeping fuel and lubricating oil in good condition, and International fresh water filters. A 12,500 watt Barnsdall electric water distiller assures a good supply of fresh water. Two Korfund mounted Worthington air compressors supply starting and maneuvering air. A second set of Briggs oil filters services the fuel and lube oil day tanks.

The main engines are 2-8 cylinder, heavy duty 11½ x 15 Washington diesel engines, developing 400 H.P. at 325 r.p.m., fitted with Kingsbury Thrust bearings and driving 64 x 56 inch 3 bladed propellers through Tobin Bronze shafting and Goodrich Cutless stern bearings.

A battery of fuel oil, lube oil and ometer, and a composite 2-way 500 watt radio code set and 350 watt radiotelephone set, both of world-water tanks are located each side of he shafts, with capacities for 6,200 gallons of fresh water, 17,000 gallons of fuel oil, 1,000 gallons of lube il and 700 gallons of gasoline. The atter being for the twin 22-foot, 5 H.P. power launches mounted on Quadrant davits atop the deckhouse. Levelometers made by the Liquidometer Corporation, and Penn Electric Air Volume controls are fitted to this tank system.

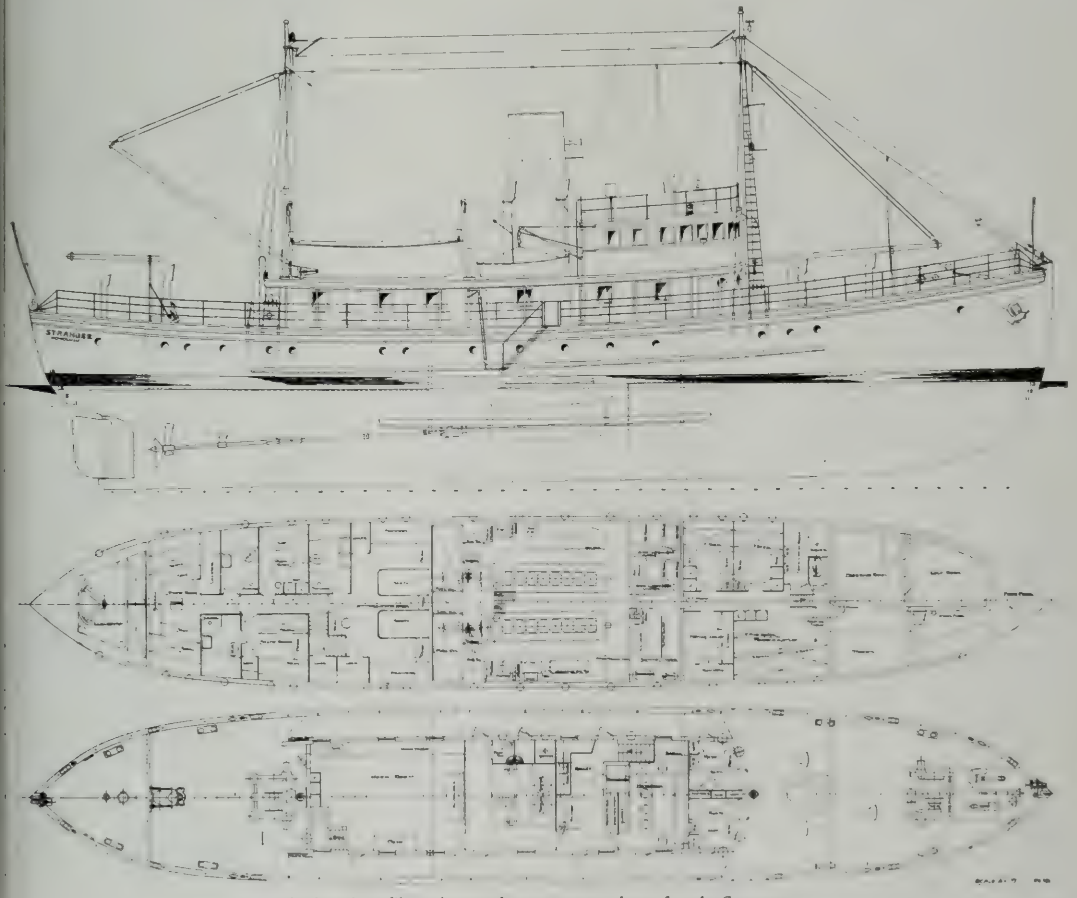
A 750 ampere hour, 110 volt, 56 cell Gould Cathanode storage battery is carried in a ventilated, enclosed battery room, opposite the pair of 10 K.W., 2 cylinder Lister auxiliary diesel generating sets. Two 15 K.W., G.E. belt-driven generators are driven off the main engine. A large K.-D. cold front switchboard takes care of the electric distribution.

Twin Weston Tachometers are mounted in both the engine room and pilot house. A battery of Worthington motor driven pumps, Kuno Autokleen filters and three ventilating fans, three Maxim Silencers and a CO_2 Fire Extinguisher system are also neatly arranged in the engine room.

All piping throughout the ship is of wrought iron and all wiring is carried in armored cables. Alaskan Copper Works heat exchangers are fitted to the auxiliary diesels for cooling the circulating water. The main engines are cooled directly by sea water.

Forward of the engine trunk is the compact galley lined with asbestos tile and fitted with a Lang oil burning range. A small messroom and two officer's staterooms are also located forward. Aft, in the large deckhouse, is the combined workroom-laboratory-lounge, with direct stair entrance to owner's and guest rooms below.

Deck machinery, including heavy anchor winch, 1,500 foot dredging machine and gypsy, are all the products of Lee H. Bennett of Seattle. The pilot house is equipped with a Sperry Metal Mike, a Kolster Direction Finder, 2 Weston Tachometers, a Sperry searchlight, a Fathometer, a 12-outlet Graybar ship's telephone, a Julian P. Friez Anem-



Outboard profile and general arrangement plans of yacht Stranger.

wide range. There are said to be 160 electric motors aboard.

A large double owner's cabin the full width of the ship, and two guest rooms with three private baths, are located aft, below the laboratory. The photographic dark room is also fitted in this space.

A full crew, including carpenter, mechanic, navigators and radio man is carried, to permit extended voyages to Alaska, the Caribbean and the South Seas.

The entire ship is finished in brilliant white enamel, with exception of the engine room, which is entirely painted in aluminum. Brasswork has given way to stainless steel, and the floor plates below are Duraluminum. The calked decks are arranged so that tropical rain water may be collected in tanks and filtered for domestic use, should the fresh water still be unable to supply as much as needed. The owner is away six months at a time, hence every known mechanical convenience is provided to make life away from civilization as comfortable as possible. The vessel is fully documented for transit of the Panama Canal. She was one of the costliest vessels ever built in Seattle, in proportion to her size.

Mr. Geary has supervised the entire construction and design, remaining in Seattle for the past seven months, along with Capt. Lewis, who selected and supervised the installation of all machinery and special equipment. Interior layout was designed by Mrs. Lewis. Capt. Lewis carries master's papers and plans an extended trip to the West Indies immediately after leaving Los Angeles.

F-M High Speed Diesel Popular on Puget Sound

During the 1938 season in the Pacific Northwest a large fleet of widely assorted vessels on very diverse trades have been powered with Fairbanks-Morse diesel engines. Among many such installations the following are particularly noteworthy:

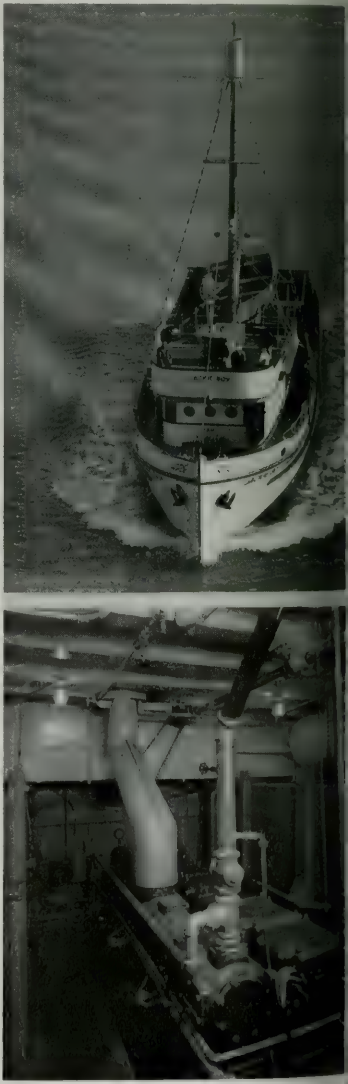
Easily the most important and the most powerful is the big 1050 B.H.P. two cycle engine installed in the tug Neptune for the Washington Tug and Barge Company. This is the largest two cycle workboat diesel engine in the Pacific Northwest and one of the largest tugs on the Pacific Coast.

Two very interesting and novel installations were placed in a pair of practically identical purse seiners, Zephyr and Jackie Boy, built by the Martinolich Shipbuilding Corporation in Tacoma for California fishermen. Each of these vessels is of heavy wood construction, 80 feet long by 21 feet beam by 8.5 feet depth, and each is equipped with complete layshaft auxiliary hook up driven by chain and sprocket from the main engine.

The Jackie Boy is powered with a 210 B.H.P. high speed Model 36-A Fairbanks-Morse diesel, and the Zephyr has a 280 B.H.P. engine of the same type. Both engines are of the new F-M four cycle valve in the head design with Bosch fuel injection system. This type is of high speed and light weight and drives the propeller through a Farrel- Birmingham reduction gear. The complete unit occupies little more than one-half the space occupied by a four cycle slow speed engine of the same power rating. These two boats are said to be the first commercial fishing vessels with reduction gear drive on the Pacific Coast. The illustrations of Jackie Boy show the trim arrangements of these seagoing boats and the engine room interior.

Other notable Fairbanks-Morse diesel installations are: a 90 B.H.P. engine in the freighter Stanwood for Skagit river service; a 375 B.H.P. engine replacing an older 240 B.H.P. unit in the auto ferry Defiance at Tacoma; and a 500 B.H.P. engine in the new steel tug Port of Bandon.

The many new models in both two cycle and four cycle Fairbanks-Morse diesels afford a very wide choice of power units covering completely the needs of operators in the workboat field.



Purse seiner Jackie Boy and her engine

Senate Report No. 184

Its Application to Safety of Life and Property at Sea on American Merchant Ships

By **COMMANDER HOWARD L. VICKERY**

The philosophy of safety of life and property at sea is no different from the philosophy of safety of life and property ashore. The principal objective in both cases is to conserve life and property and to minimize losses. However, the means and methods employed on merchant vessels to attain this objective are somewhat different as compared with buildings ashore. These differences are principally due to the difference in geographical location, in construction, and in the ever present natural and accidental hazards incident to the marine business.

In the first place, a ship is a floating object. It is a very complicated structure and is generally far removed from aid, save for that obtained from its own equipment. Furthermore, a vessel is constantly exposed to the hazards of the sea, such as storms, tidal waves, collision, grounding, and fire. Therefore, the safety features installed on any vessel must be sufficient and adequate to cope with any kind of a hazard which might destroy the vessel or prevent it from making port under its own power.

The two major causes of disaster at sea are fire and foundering. It was with this in mind that the United States Congress, pursuant to Senate Resolution No. 7 (74th Congress), authorized an investigation which resulted in Senate Report No. 184, which was submitted by the late Senator Copeland to the 75th Congress (1st Session), and was made public on March 17, 1937.

A large amount of pioneer work had been done to promote safety at sea by the National Fire Protection Association. This body had formed a Marine Section in 1934 to study "Fire Resistive Construction," which studied and prepared tentative reports concerning "Fire Resistive Construction" for ocean and coastwise vessels; safety measures to be taken in the repair and layup of vessels; regulations to cover construction, maintenance, manning and navigation of tankers; safety regulations for motor craft; fire detection, alarm and extinguishing apparatus; electrical systems and apparatus on ships; the operation of marine terminals; and reports on stowage of hazardous cargoes. Many of the suggestions contained in these tentative reports were adopted and are important contributions toward safety.

This work of the National Fire Protection Association committees was not completed because similar work was undertaken by the committees authorized by the 74th Congress.

Senate Report No. 184, known as the "Morro Castle" and "Mohawk" Investigation, was in the nature of a preliminary report of the Committee on Commerce and related primarily to the investigation of the disasters to the steamships Morro Castle and Mohawk, and the methods and practices for the further promotion of safety of life at sea.

Morro Castle was destroyed by fire off Asbury Park, New Jersey, on September 8, 1934, and resulted in the loss of 134 lives. Mohawk was sunk as the result of a collision off the Jersey Coast on January 24, 1935, resulting in the loss of 45 lives.

Necessity for remedial measures for the prevention of disasters similar to the Morro Castle and Mohawk was felt to be urgent and steps were taken to invoke the aid of the country's most prominent naval architects and marine engineers, under the chairmanship of Admiral George H. Rock, to study and submit a report with this end in view. The result of their labors, which extended over a period of 18 months, is embodied in Senate Report No. 184.

This report is the most comprehensive that has ever been made public in the world, on the subject of safety at sea, and covers recommendations for new construction of all types of ships, which, if put into effect, will provide standards of safety that will, it is hoped, prevent disasters similar to those which formed the basis of the technical committee's investigation.

Although the recommendations of this report have not yet been enacted into law, practically all new vessels, particularly those of the ocean and coastwise types, are now being built to comply generally with its provisions. A notable example of this application is the large United States Lines' liner now being built to replace S.S. Leviathan; the three cargo and passenger vessels now being built for the Panama Railroad Steamship Company; the twenty cargo vessels of the C-2 class being built for the United States Maritime Commission; and the four cargo vessels being built for the American Export Lines.

While the losses on American vessels over a period of twenty years have been comparatively small, the Maritime Commission deems it justifiable to require that all vessels, built with its financial assistance, must comply with Report No. 184, in order to further conserve life and property.

The United States Maritime Commission is establishing further safety at sea by requiring that all cargo vessels be at least one compartment vessels, which means that all cargo vessels built under the Merchant Marine Act of 1936 will be able to remain afloat when one compartment is flooded.

Contrary to the general impressions created by some of the opposition articles, which have appeared from time to time in several of the maritime publications, most of the requirements of these recommendations have presented no difficulties to the designers or the shipbuilders and have involved very few changes in the past methods of construction and operation of the vessels. The only exception to the above statement is found in the methods and materials presented in Chapter III on subdivision, and in Chapter IV on Fire Control.

Prior to the two disasters mentioned above, vessels were designed and built using standards of methods and materials which were the best of that time, and it required exceptional and unusual sequences of incidents and conditions to show that better methods and materials were essential to improve the standards of that time.

Source Material

The recommendations and material presented in the Senate Report were for the most part derived from the above events and the following general sources:

(1) Existing legislation, and the present rules and regulations of the Department of Commerce;

(2) International Convention for the Safety of Life at Sea, 1929; ratified by the United States in 1936;

(3) Construction rules of the classification societies, particularly the American Bureau of Shipping; and

(4) Generally accepted good practice in design and construction.

Although the rules and material found in these sources have in some cases been exceeded and amplified, when included in Senate Report No. 184, particularly as regards those of the Convention, the Marine Industry is so familiar with the material contained in these sources, and is so used to designing, constructing and operating vessels in accordance with them, that no great difficulty has been or should be experienced in the application of all but two parts of the Report. In fact, the Report is of inestimable value as a guide for design, containing, as it does, in one volume the important information included in all four sources.

The two subjects covered by Senate Report No. 184, which are the most far reaching in their application, as they affect the design and methods of construction and operation of vessels, are those given in Chapter III—Hull Subdivision, and Chapter IV, Hull Fire Control. Since their application has been found somewhat more difficult than the other chapters they will be discussed more fully, and only brief comment will be made on the other chapters.

Review of Report No. 184

The application of Chapter I of Senate Report No. 184 requires, first, that the type of vessel under consideration should be determined, i.e., whether passenger or cargo vessel; and second, that she be placed in the proper group, having in mind the service in which she will operate.

The type of vessel having been settled, and the group she is to be placed in known, the application of the recommendations regarding construction are applied without any difficulty. Inspections of vessels under construction and during the service life of the vessel are not new provisions and will work no hardship. Characteristics of materials to be used for hull structures, which are dealt with in Part I of Chapter II, were those required by the Classification Societies, and no new recommendations were made concerning them.

The provisions of Part II of this Chapter, which deal with structural strength, did not set up any new standards. Structural necessities in the past had required that every vessel should have sufficient strength for the intended draft and service, and should conform to the requirements set up by the Department of Commerce for the establishment of loadlines, and this standard was not changed. Large passenger liners, the structural failure of which might involve the loss of many lives, will, as before, require special consideration.

Part III of this chapter deals very briefly with welding and contains no recommendations as to methods or types to be used, but indicates that the committee was entirely receptive to developments which were expected to be made in this art, and which, after due consideration and satisfactory tests, should be allowed to be used.

Watertight Subdivision

In Part I of Chapter III, which deals with subdivision, the requirements of the International Convention for the Safety of Life at Sea have been considerably exceeded. The formulas established by the Convention to determine the degree of subdivision of any ocean-going passenger ship used, as their bases, vessels of two types of quite diverse characteristics, i.e., vessels primarily of the cargo type, and vessels primarily of the passenger type. The amount of subdivision economically practicable on the two types is, of course, quite different, inasmuch as the bulkheads in the primarily cargo type will be normally spaced relatively further apart than in the primarily passenger type, in order to provide larger cargo stowage spaces.

Most of the passenger vessels built fall between the extremes of the two basic convention types, and provision was made in the Convention, by means of other formulas, involving factors—such as number of passengers and machinery space volume—for interpolation between the extremes to establish the subdivision requirements of any particular vessel.

However, the Senate Committee on Subdivision concluded that while the Convention requirements marked a substantial advance in the direction of marine safety they did not go far enough in ensuring the safety of passenger ships against collision, and accordingly the Senate Committee strengthened the Convention formulas so as to demand better subdivision in practically all cases, particularly where the number of passengers carried is comparatively large.

The ideal which the Committee worked to attain was to produce regulations whereby ships carrying passengers in considerable numbers would be subdivided, and have sufficient stability to meet a two-compartment standard at the shortest length at which this was economically practicable. By a two-compartment ship is meant a ship that could suffer damage to one of the main bulkheads, thereby opening two of the main compartments to the sea, and continue thereafter to float. Larger ships carrying still more passengers are required to meet still higher standards of subdivision.

The proposed regulations will tend to increase, in most cases, the number of bulkheads in new ships, over that required by the Convention, but the application to recent designs has presented no difficulties.

The application of Part II on stability in damaged condition will require more attention to the subject on the part of the designer and operator than heretofore. This subject has only been covered very sketchily up to the present time, and very little attention was given by the Convention to this important feature. However, it has been found that the requirements of the proposed recommendations can be readily met. This is partially due to the conditions and assumptions which are allowed to be used for the purpose of fulfilling the requirements. For example, a limit is given for the stability in the intact condition beyond which the designer is not required to go, and certain additional relaxations are also allowed. If a ship is slightly less than a two-compartment ship the requirement for stability in a damaged condition drops back to a one-compartment standard, and if a ship is not quite a three-compartment ship the requirement for stability in a damaged condition drops back to a two-compartment standard.

While Part III, which covers Water Tight Integrity, is in excess of the Convention, no great difficulty has been or will be found in its application. The requirements for watertight doors are more rigid and the rules for openings in the sides of the ship below the bulkhead deck, such as air ports, have been revised to provide a higher standard than that of the Convention. This is a step in the right direction and will require but very little additional attention on the part of the designer.

Part IV, Subdivision Loadlines, does nothing more than repeat the requirements of the Convention, and, therefore, does not change the existing requirements.

The application of this chapter is such that while the standards are not quite practicable of attainment, the designer is faced with a much more complex task than heretofore; however, a ship suffering severe injury on the high seas is in a particularly precarious position, and a passenger seldom has any data available whereby he can assess the relative safety of the ships offered him as a means of transportation. He, therefore, not illogically looks to his government to take reasonable steps to assure his safety. Chapter III is the Senate Committee's contribution to that end.

Fire Control

The recommendations covered in Chapter IV for "fire control" are considered to be an extremely important contribution towards the promotion of safety at sea. Any outbreak of fire which cannot be brought under control will inevitably spread and may possibly result in a serious loss of life. We all have vivid recollections of a recent ship fire resulting in the loss of many lives, and which was in a great measure due to the fact that the course of the fire could not be controlled.

The first problem, then, which confronted the committee was the establishing of a general method of fire control that would be the most practical combination of effectiveness and simplicity, and the solution appeared to the evolving of a method of construction which would confine any fire to the enclosure in which it originated.

In order to achieve such a method of construction, it was found necessary to segregate the cargo and working spaces of the vessel from the passenger quarters by fire screen bulkheads, and again subdivide the passenger and crew's spaces into fire zones; also to substitute incombustible stateroom enclosure bulkheads for the usual joiner partitions of combustible materials. The development of a satisfactory type of construction for the main fire screen bulkheads, and of satisfactory assembly methods incorporating suitable incombustible materials for the statero0om enclosure bulkheads, was one of the major accomplishments of the committee.

The tests of these materials and new methods of construction were carried out on the S.S. Nantasket, then at anchor in the James River, which was placed at the Committee's disposal by the Merchant Fleet Corporation of the Shipping Board Bureau. These tests covered an investigation period of about eighteen months and involved the making of approximately twenty-five separate tests. The data obtained was used by the Committee to formulate recommendations that could be used for future construction of main fire screen and stateroom enclosure bulkheads.

The materials developed and methods of construction recommended were required to meet the standards of fire intensity that had been adopted for land practice, namely 1700° Fahr. Those for the main fire screen bulkheads were required to maintain their integrity for the first hour of this standard test, and those for the stateroom enclosures to maintain their integrity for the first thirty minutes of the standard fire intensity curve.

In both cases the transmission of the heat through the bulkhead was required to be kept down to a point that would insure that materials of a light combustible nature, hung on the side of the bulkhead not exposed to the fire, would not become ignited and cause the spread of fire.

Recommendations regarding methods of construction of doors and windows suitable for use in stateroom enclosures, based on actual tests, were included in the report.

Many types of deck coverings were also tested for their resistance to fire and non-smoke producing qualities, and recommendations were made of materials that were considered satisfactory.

The application of new materials and systems of erection developed by these tests will require that the established practices for joiner work will have to be discarded and a new technique developed; thus making obsolete a large part of the wood working machinery in our shipyards.

A more orderly and careful planning of arrangements of passenger and crew's accommodations, ventilation, piping, and electrical systems will be required when using these new materials than was previously the custom, in order to obtain an economy of labor and materials.

The weights of materials of an incombustible nature have been found to be somewhat in excess of those which they will replace, and the designer is faced with a problem of increased weight generally in a location which will involve an adverse effect on stability.

Chapter V, which deals with engineering, covers a considerably broader field than was previously covered by Governmental regulations. The work of the Engineering Committee was also a major contribution toward insuring increased safety at sea.

The engineering rules previously in force were not modified in principle, but were greatly amplified and indicate receptiveness towards the encouragement of the development of materials and machinery suitable for higher pressures and temperatures.

Lifesaving Equipment

Chapters VI and VII, which cover lifesaving equipment and special appliances, are in excess of previous regulations and convention requirements and are intended to insure that a vessel built to conform with the new requirements will be adequately equipped for its respective purpose.

The application of the recommendations of Senate Report No. 184 to new construction, from the designer's standpoint, will require considerably more thought to be given to the development of a new design than heretofore. This is due to the fact that some increase in weight is involved by the use of incombustible materials that are required to be used to insure that fire control can be obtained and also due to the changes in subdivision, and stability when damaged, to meet the provisions of the recommendations. However, all of the provisions of Senate Report No. 184 can be met by careful design even though the incorporation of these provisions may involve a slight increase in the dimensions of any vessel under consideration.

In conclusion, it will be seen that the main considerations for safety at sea are predicated upon keeping a vessel afloat, controlling fires and getting the vessel to her destination, all of which are of paramount importance with regard to the conservation of life and property.

Abstract of an address before the National Safety Conference, Chicago, Oct. 11, 1938.

The Worm Turns

A printer got slightly peeved at a letterhead from a doctor who wanted bids on several thousand letterheads, different sizes, different grades, and different colors, and wanted the printing form held standing. So the printer took his typewriter in hand and wrote:

"Am in the market for bids on one operation for appendicitis. One, two, or five-inch incision—with or without ether—also with or without nurse. If appendix is found to be sound, want quotations to include putting back same and canceling order. If removed, successful bidder is expected to hold incision open for about sixty days, as I expect to be in the market for an operation for gallstones at that time and want to save the extra cost of cutting."

Mackay Radio Exhibit

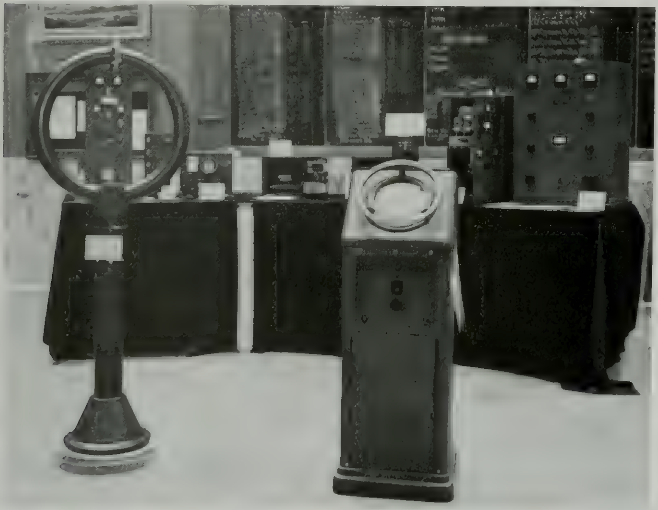
A display of modern marine radio telegraph and radio navigation equipment supplied by Mackey Radio and Telegraph Co. was recently on exhibition at San Francisco's famous Marine Exchange.

This display consisted of a complete installation for a cargo or passenger vessel and each unit illustrated the latest design built to meet all the requirements of recent rulings and legislation governing safety of life at sea.

This interesting exhibit was arranged by S. W. Fenton, marine superintendent for Mackay Radio and Telegraph Co. on the Pacific Coast.

Referring to the illustration, the equipment on the table includes: a 200 watt intermediate frequency main transmitter; a 50 watt emergency transmitter; a 50 watt short wave transmitter; an all wave length receiver; and the two principal units of the Mackay Radio Auto Alarm.

In the foreground, on the floor, is a Kolster Radio Direction Finder, with its appropriate rotating loop. This is of the same type and model as those installed on the new Pacific Coast tankers Associated, W. H. Berg, and H. D. Collier. It will also be installed on the new Union Oil tanker now under construction.



Spunyarns and Catharpins

Hoot Mon

Marine: "The U. S. Marines have been entitled to bear arms for one hundred and sixty-three years."

Scotty: "Hoot Mon, that's nothing; our regiment has been entitled to bare legs for the last 800 years."

—Leatherneck.

The Cocoon Blues

We heard a couple of moths complaining the other night about the poor eating in America during the present decade.

"Why," said one moth, "when my great-grandfather was a boy he lived on the fat of the land. Fine furs, the best of clothing, sofas and upholstery. But today you can't get a square meal anywhere."

"Yeah," said the other moth, "I been everywhere. No matter where you go, it's the same. You bite into a suit and it's shoddy. You follow a fur home—and it's imitation. The stuff they use on chairs is mostly synthetic. It's getting so a respectable moth has to get down on his knees and beg to get a little nourishment."

"You said it," agreed the first moth. "All I've had in weeks is cellophane and wood pulp and Dupont derivatives. I'm getting so thin I whine like a mosquito when I fly. I tell you the country has gone to the dogs."

"And that's not all," said the second moth. "They're making curtains out of glass, and cushions from soy beans, and fiber bathing suits. And down at Santa Cruz a bunch of nudists have quit wearing clothes altogether. Where do we get off if that becomes popular?"

"I'll tell you where we get off," said the first moth. "We'll all be on the WPA with the rest of the country. And what makes me sore, I was in a closet a whole night with a Democrat's overcoat and didn't eat a single hole in it."

The second moth stepped back and looked at his friend in horror.

"Why, you rat!" he said.

—Earl Ennis in S. F. Chronicle.

To the American Ship Operator

1934

"If your nose is close to the grindstone rough
And you hold it down there long enough,
Then for you three things will this world compose -
Just you and the stone and your damned old nose.

1936

"Now your good Uncle Sam has stepped into the scene
And seized your grindstone on a Shipping Board lien.
All reports indicate your financial prognosis
Comprises yourself and your ancient probosis.

1938

"But the sale of the grindstone won't cover the debt,
So your much revered Uncle is after you yet.
This year he may take both your teeth and your clothes;
In fact, you're in luck if he leaves you your nose.
So why worry unduly o'er business or pelf;
If this process continues you'll soon be yourself."

A Wise Tip

A colored porter in a hotel was asked why rich men usually gave smaller tips than poor men.

"Well, suh," the porter answered, "The rich man don't want nobody to know he's rich, and the poor man don't want nobody to know he's poor."

—Windy City Breeze.

Bedtime Stories

"When I was a little child," the sergeant sweetly addressed his men at the end of an exhaustive hour of drill, "I had a set of wooden soldiers. There was a poor little boy in the neighborhood and after I had been to Sunday School one day listening to a stirring talk on the beauties of charity, I was soft enough to give them to him. Then I wanted them back and cried, but my mother said:

"'Don't cry, Bertie, some day you'll get your wooden soldiers back.'

"And, believe me, you lopsided, muttonheaded, goofus-brained set of certified rolling pins, that day has come."

Which reminds us of the lineman who was cited before the big boss on the complaint from lady dwellers in an apartment house that he had indulged in "frightful language while working on a pole opposite their window."

In response to inquiry from the chief, the lineman replied, "Well, you see, boss, it was this way: I was making a splice in a wire and my helper on the cross arm just above me was melting the solder in a pot. He got careless, the pot tipped, and a few drops of hot solder ran down my back inside the shirt. So I looked up at him, and as gently as I could under the circumstances I said, 'Now look here, Bill, please be a little more careful with that solder'."

The Catcher's Mutt

Jim—"What makes you call him a baseball dog?"

Bill—"Cause he wears a muzzle, catches flies, chases fowls and beats it for home when he sees the catcher coming."

—5th CA News.

A New *Variable Capacity Oil Burner*

Recent Development in Pressure Atomizers for Fuel Oil Combustion in Furnaces of Marine Boilers

The latest and longest step in the art of fluid fuel combustion, and comprising so many new features as to be considered the answer to a long felt need in the oil-steam power production field, a new Todd Variable Capacity Mechanical Pressure Atomizing Burner made its appearance recently.

Invented, designed, and, after several years of experimenting, produced by the combined engineering staff of Todd Combustion Equipment, Inc., 601 West 26th Street, New York, N. Y., the new Variable Capacity Burner numbers among its many provisions and improvements the following:

Unlimited combustion range without change of burner tips, without change in oil delivery pressure, without change in angle of spray and without loss of atomizing efficiency.

Automatic control without loss of efficiency over all firing ranges.

Constant steam pressure regardless of demand.

Allows the boiler to follow the sudden and widely varying steam load requirements which might be called for in backing, filling or cruising for vessels of all types.

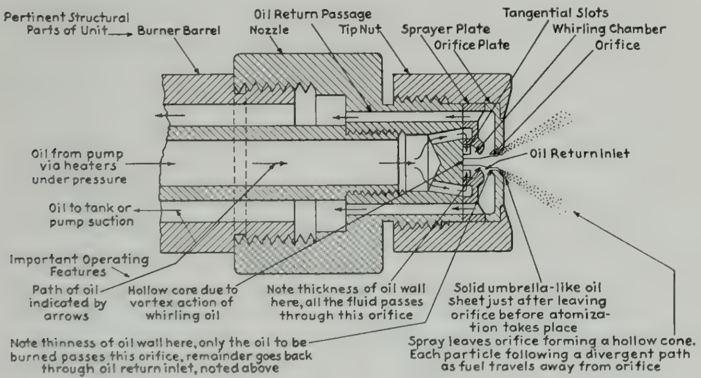
Fuel consumption follows the steam demand and so creates economy of operation.

Whenever steam is one of the ingredients of operation the Todd Variable Capacity Burner can reduce overall costs.

It eliminates the necessity of contending with the human element.

Because of automatic control—that is, the ability to follow so completely load requirements—and the fact that the capacity curve is a straight line and not a square-root curve like other burners, and that the air-flow curve is a straight line, a constant and proper ratio of fuel-to-air is maintained throughout the entire range of boiler operation, thus maintaining maximum CO_2 and resulting in boiler efficiency.

Another feature of great importance is that it vastly reduces the requirements for cleaning burner tips, because as the load or capacity is reduced the returned oil acts as a cooler to the burner tip. The burner itself is kept open and clean through the discharge aperture, because the smaller the quantity of oil which is passed out into the furnace the greater the washing action caused by the balance of the oil being returned.


Pertinent Structural Parts of Unit
Burner Barrel
Oil Return Passage
Nozzle
Tip Nut
Sprayer Plate
Orifice Plate
Tangential Slots
Whirling Chamber
Orifice
Oil from pump via heaters under pressure
Oil Return Inlet
Oil to tank or pump suction
Important Operating Features
Path of oil indicated by arrows
Hollow core due to vortex action of whirling oil
Note thickness of oil wall here, all the fluid passes through this orifice
Solid umbrella-like oil sheet just after leaving orifice before atomization takes place
Note thinness of oil wall here, only the oil to be burned passes this orifice, remainder goes back through oil return inlet, noted above
Spray leaves orifice forming a hollow cone. Each particle following a divergent path as fuel travels away from orifice

New Todd Variable Capacity Oil Burner

● Design of Atomizer

There are three possible variables which enter into the problem of design: first, pressure; second, the characteristics of the restricted orifice (design of atomizer); and, third, the volume of atomized oil admitted to the furnace.

The principle of varying the pressure to produce a "wide range" has been used for some years with limited success, and only through a relative narrow scope, but with an efficiency of atomization rapidly decreasing with the lowering of the pressure.

Changing the characteristics of the atomizer by moving parts was tried and given up because of the inconsistency of oil temperatures and the resulting uneven expansions and contractions of the parts.

During industrial tests and also during the most exhaustive engineering laboratory tests ever run, all results contributed to the conclusion that ideal atomization and resulting furnace efficency were brought about by 300 lbs. mechanical pressure applied on the oil to force it through properly designed restricted orifices of the particular size to suit the quantity of oil required to be burned.

With 98 per cent efficiency in the

Standard Todd mechanical atomizing burner, little could be done to improve the atomization resulting. The problem then resolved itself to varying the quantity of this 98 per cent perfectly atomized fuel which reached the zone of combustion and produced the required effective heat.

The outcome of these studies produced virtually a double burner—a regular mechanical atomizer embodying all the details and quality previously proved, and above and around this an ingenious scheme for reducing the quantity of this 98 per cent perfectly atomized oil from the full capacity of the burner to a minimum.

That part of the atomized oil which is not required to be converted into heat is returnable either to the pump suction or by the use of an auxiliary pump back to the discharge side of the fuel oil heaters.

In the second case, the small amount of power required to operate the auxiliary pump salvages completely the energy that already has been expended to prepare the oil for atomization; and only sufficient oil is passed through the pumping, heating and straining equipment from the storage tank to correspond to that amount which has been burned. This eliminates the necessity of constantly running the pumping, heating and straining equipment, with a resulting saving in operating cost.

The tanker Esso Bayonne, constructed by the Federal Shipbuilding & Dry Dock Company for the Standard Oil Company of New Jersey, is fitted with two Foster Wheeler water tube boilers, each of which is fired with three Todd "Hex-Press" air registers. Originally these burners were of the standard mechanical pressure atomizing type, which recently were changed over to the new Todd variable capacity type.

The Todd Variable Capacity Burner makes it possible to change the firing rate instantly, either manually or automatically, throughout ranges inconceivable a short while ago and still maintain at all rates of firing the desired advantages of the 98 per cent efficient atomization offered in the standard Todd mechanical atomizing oil burning equipment.

Todd engineers designed and developed the Todd variable capacity burner so that it also may be applied to existing Todd mechanical atomizing oil burner plants without expensive or complicated alterations.

NEW LIGHT WEIGHT COMPACT ARC WELDER

To meet the great demand for a light weight, compact, direct current arc welding machine Victor Equipment Company announces the arrival of the new General Electric Type WD-3150-B, 150 ampere capacity arc welder.

This arc welder is unusually compact and requires only 2½ square feet of floor space. Low center of gravity obtained with horizontal construction provides excellent mechanical stability, even when mounted with running gear as illustrated.

The rotor of this two bearing motor-generator set is dynamically balanced for smooth operation. Ball bearings are grease sealed to retain the lubricant and to exclude dirt. Its high instantaneous recovery of voltage, popularly known as "pep," prevents arc pop-outs at all points in the wide welding range, with any good lightly coated or heavily coated electrodes. This feature is of special value for fast, easy welding on low current work with small electrodes. Its excellent stability and flawless performance over the entire range prevent current surges and thus avoid excess spatter loss, and prevent sticking of the electrodes. The machine handles electrodes of from 1/16" to 3/16" diameter because of its wide range, covering 20 to 200 amperes.

The welding current, within the wide range, is quickly and easily obtained by means of a simple, three point, selector switch and an easily operated dial for intermediate adjustment.

Additional assurance of dependable operation for continuous use is provided by reliable self-excitation.

Isothermic overload protection permits the welder to carry maximum safe overload without danger of burn out and without unnecessary interruption on harmless overload.

Excellent cooling keeps the temperature rise to a minimum.

Victor Equipment Company's Welding Division offices at Los Angeles, Fresno or San Francisco will gladly arrange for demonstrations of this new General Electric arc welding machine.

A NEW PLASTIC CORK-RUBBER FLOORING

Introduction of a plastic, non-slip, water-resistant cork and rubber flooring material called "Monocork" has been announced by the Armstrong Cork Company.

Originally developed by Armstrong's British subsidiary, the product, known in foreign countries as "Aranbee," has been installed on entire deck areas of the Cunard liner Queen Mary, her sister ship the Queen Elizabeth, now under construction; the new Holland-American Line flagship, the Nieuw Amsterdam; and a large number of British Admiralty ships, where the material has been used both as a subfloor between the steel deck and linoleum and rubber tile floor coverings, and as a surface floor covering. Installations have been made in this country recently on two new Navy destroyers, an Army transport, and other vessels.

On land, "Monocork" is in use in England, Holland, and France in railroad stations, office buildings, zoos, roadways, and restaurants. Extensive use of the product will be made at the New York World's Fair, where it will be installed as a road paving material for the roof ride and ramp of the Ford Exhibition Building; as a pavement for the Helicline or ramp leading from the Perisphere; and as an exterior wall covering on the National Cash Register Building.

Monocork is a product which is composed of rubber latex, a dehydrating powder, granulated cork, and various types of fillers. The principle of setting of this composition is based upon the fact that latex sets by the loss of water, while the dehydrating agent sets by the absorption of water. When these two materials are in one mixture, the setting action of each ingredient is complementary to the other. The ingredients of Monocork are shipped to a job generally in three containers. One is for a paste containing the rubber latex and all other liquid ingredients. A powder in the second contains the dehydrating agents and all of the mineral fillers. The cork filler is shipped separately in a third container. When combined in a mechanical mixer on the job, these materials result in a plastic mixture which is troweled over the sub-base in a manner similar to the application of Portland cement, plaster, etc.

According to the manufacturer, Armstrong's Monocork possesses many desirable characteristics as a floor surfacing material. It is applied in plastic form which results in a monolithic surface. For special applications the percentage of cork granules is increased, making the floor light weight and relatively non-slippery either wet or dry. The rubber content of the composition is high enough to make the product flexible, so that it can withstand considerable distortion before cracking or breaking. The combination of cork and rubber results in a surface which is resilient underfoot, quiet under traffic, and resistant to wear. It can be formulated to be highly resistant to moisture. Monocork adheres to clean steel, concrete, masonry, composition boards, or wood surfaces. The natural color of the product is dark gray to black, and it is possible to pigment the material to obtain dark colors or one as light as battleship gray.

The product is sold for marine purposes in California by the Van Fleet-Freear Company under the name of "Monocork," and by Selby-Battersby and Company of Philadelphia, Pa., under the name of "Foranaft."

"John Crane" Glass Packing

The Crane Packing Company has recently developed an improved glass packing known as "Style 420."

This packing has many advantages, among which we enumerate the following:

(1) The fibers of glass used in this product are extremely soft—almost silky.

(2) It will stand temperatures above 600° F.

(3) The material is proof against the action of all acids with the exception of hydrofluoric.

(4) It is positively resistant to the action of most of the corrosive chemicals.

(5) It does not shrink.

(6) It does not absorb moisture or swell.

(7) It is absolutely free from sulphur or other harmful ingredients.

(8) It will not rot, deteriorate with age, or decay.

(9) Weight for weight it is 50 per cent stronger than cotton and six times as strong as asbestos.

(10) It is now manufactured in commercial sizes from 3/16 inch to ⅝ inch.

(11) It is moderate in cost and of extremely light weight.

(12) It can be supplied in either lubricated or non-lubricated forms.

Glass fiber makes up into a very resilient packing that retains its elasticity under severe conditions over long periods of use.

Conical Self-Aligning Packing Glands, a four-page booklet in colors published by the Crane Packing Company. This brochure describes and illustrates the "John Crane" self-aligning glands especially adapted for: ammonia, air, and gas compressors; reciprocating pumps; and reciprocating engines. This gland was developed to meet difficult rod packing services in one of the world's largest oil refineries and has been in successful use there since 1931.

It is used with "John Crane" Super-Seal split packing inserts molded to fit the gland.

Cranelite Products, a four-page booklet published by the Crane Packing Company. Cranelite is the name given to Bakelite products manufactured by the Crane Packing Company.

Cranelite has many applications in service aboard ship.

Copies of these two bulletins are available at the Crane Packing Co., 112 Ninth Street, San Francisco, Calif.

An Unusual Marine Forging

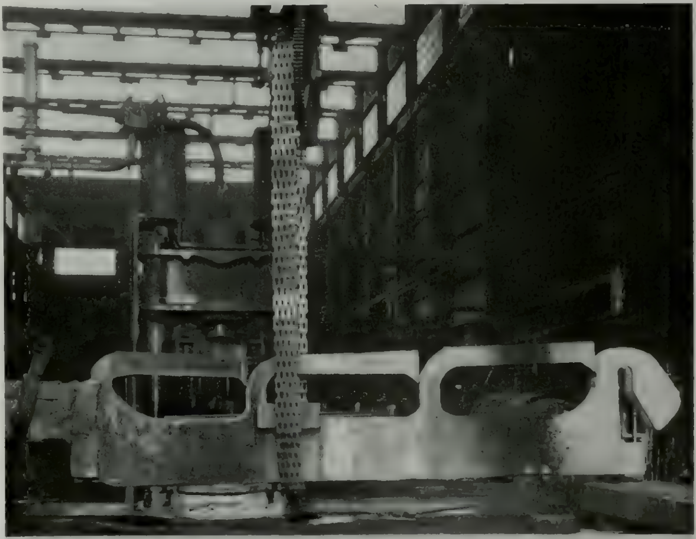
A very clever piece of heavy shipsmith work that combined expert forging and unusual oxy-acetylene cutting operations was recently accomplished at the plant of the Moore Dry Dock Company.

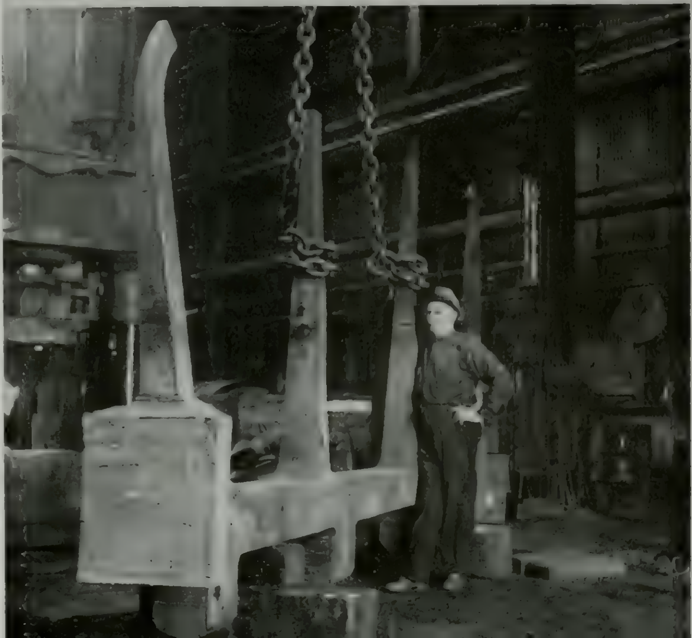
The work involved the production of a new rudder frame for the Norwegian motorship Elg, which stranded on the California coast and was salvaged and towed into San Francisco Bay in need of major repairs, one of the items being the new rudder frame.

This frame consisted of a steel skeleton having four arms, four pintle bosses, and one large pad for attachment to the rudder stock. Overall dimensions are approximately 15 feet 9 inches length, 8 feet 6 inches width, and 8 inches thickness with a pad 20 inches square at the top.

Under the direction of heavy forge smith, William A. Alversen, of the Moore Dry Dock Company, the whole frame was forged and cut from one steel ingot in the following manner: A 42-inch diameter ingot was forged under the big steam-hydraulic press into a slab of steel of a thickness slightly greater than the thickness of the finished frame and a pre-calculated width less than half the finished width with the metal required for the pad roughly shaped up at one end. This slab was then cut with torches in the manner shown in the illustration. The arms formed by this cutting were bent out straight and then forged and trimmed for taper and shape to the dimensions required. The whole frame was then thoroughly annealed to relieve all stresses and strains and, upon completion, weighed 9540 pounds.

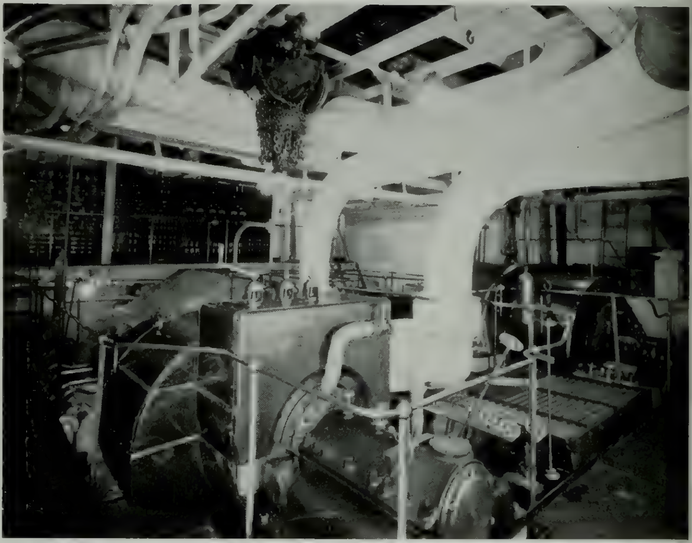
Obviously, to successfully carry out an assembly of this size by this method requires very heavy forging equipment, expert smiths, and large capacity in the annealing furnace, but it has the advantage of effecting a considerable saving in time and cost in comparison with the production of this frame either by casting in steel or by forging the parts separately and assembling them by welding.





Upper view shows forged blank after cutting out with torch. Lower view shows finished forging with Wm. A. Alversen, heavy forge smith at Moore Dry Dock Company.

A Notable Marine Propulsion Turbine Record



Engine room of Panama Pacific liner City of San Francisco, showing high and low pressure units of De Laval 9500 S.H.P. turbine.

The operating history of the five former Baltimore Mail Line steamers now operating on the intercoastal service of the Panama Pacific Line affords an interesting record of the dependable, economical service of modern geared turbines in marine propulsion.

In 1930 the Baltimore Mail Steamship Company purchased from the U. S. Shipping Board five cargo vessels of the standard 9600-ton deadweight type. These vessels were the steamers Steadfast, Eclipse, Victorious, Archer, and Independence. All of them were built at the Alameda Works of the Union Plant of the Bethlehem Shipbuilding Corporation Ltd. during the Great War shipbuilding boom in 1918. Propulsion machinery installed when the vessels were built was geared steam turbines of approximately 3,000 shaft horsepower, which gave these ships a sea speed of approximately 11 knots.

In 1920 four of these hulls were converted to turbo-electric drive with 4,000 shaft horsepower, giving them a sea speed of approximately 12.5 knots.

On the North Atlantic service for which the Baltimore Mail Line purchased the five vessels it was necessary to have 16 knot steady sea speed in order to maintain schedules.

The ships were therefore lengthened by fifty feet and their bow and stern lines altered to designs prepared by Gibbs and Cox Inc., naval architects of New York City. The machinery was all removed and in each ship there was installed a set of De Laval cross compound double reduction gear turbines of 9,500 shaft horsepower capacity on a propeller shaft speed of 95 r.p.m.

Cabin class passenger accommodations for 63 passengers were built into each vessel.

When this rebuilding was complete the vessels had the following general characteristics:

Length O. A.	506 feet
Length B. P.	486 feet 7½ inches
Molded beam	56 feet
Depth S. D.	38 feet
Draft normal	24 feet
Gross measurement	8,424 tons
Net measurement	5,222 tons

At that time they were renamed respectively City of Baltimore, City of Hamburg, City of Havre, City of Newport News, and City of Norfolk.

The De Laval turbines installed in these five vessels are of the cross compound type with the high pressure turbine and the low pressure turbine in series and each connected through a flexible coupling to one of the high speed pinions of the De Laval double reduction gears. The high pressure rotor has a normal full load speed of 3,500 r.p.m. while the low pressure rotor turns at 3,050 r.p.m. An astern turbine consisting of a single stage astern element in the high pressure turbine casing and a single stage astern element in the low pressure turbine casing, each having two rows of buckets, is capable of delivering 60 per cent of the full ahead power.

With a normal rating of 9,500 shaft horsepower at 95 r.p.m. propeller speed this plant will deliver approximately 9,900 shaft horsepower at 99 r.p.m. propeller speed on steam conditions of 250 lbs. throttle pressure and 100 degrees Fahrenheit of superheat, and with 28¼ inches vacuum. In each ship four Babcock and Wilcox oil burning water tube boilers supply steam at 275 pounds gage and 100° F. superheat, operating on forced draft supplied by two American Blower fans driven by De Laval 16 horsepower turbines.

De Laval Turbine Company supplied also two main boiler feed pumps for each ship.

Three Westinghouse turbo-generating sets and a Winton diesel emergency generating set take care of the electrical requirements. Two De Laval oil purifiers keep the lubricating oil clean.

The conversion proved very satisfactory. The ships developed trial speeds of from 17.7 to 18.4 knots and on 13 voyages of four of these vessels covering a total steaming distance of over 400,000 nautical miles the average speed was 16.82 knots and the fuel consumption approximately .7 pounds per shaft horsepower hour.

These vessels have recently been transferred to the Panama Pacific Line intercoastal service. Names have been retained except for City of Hamburg and City of Havre, which have been renamed City of Los Angeles and City of San Francisco.

At the time of transfer to the intercoastal service these vessels had completed round voyages and mileage on the Atlantic as follows:

	Miles
City of Baltimore (71 trips)	568,000
City of Los Angeles (68 trips)	544,000
City of Newport News (66 trips)	528,000
City of Norfolk (70 trips)	560,000
City of San Francisco (68 trips)	544,000
Total mileage	2,944,000

On examination the turbines and the gears were found in excellent condition, with no appreciable wear and with only minor adjustments necessary to prepare them for the new service.

Boiler Performance on Tanker Associated

The first installation of separately fired superheater marine steam generators has recently been placed in service on the Tide Water Associated Oil Company's tanker Associated. The performance records of these boilers are essentially interesting to marine engineers following this new development. The advantages are so great that success or failure of the design in regular service is of prime importance to the industry.

The fundamental principle involved is that of an "A"-type, saturated steam, marine boiler into the setting of which is built a separate furnace with oil burner for superheating the steam as required for operation of the ship's machinery. This enables the operator to start a cold turbine on saturated steam, run it without superheat until thoroughly warmed up, then add superheat gradually and as desired until maximum conditions are reached.

It is quite logical that such a design should be applied first to an oil tanker, since the large requirements of saturated steam for operation of cargo pumps, auxiliaries and for heating cargo ordinarily involve the complication of desuperheaters and the necessity of superheating the steam that is not to be used in that state, merely to protect the superheaters from damage.

The flexibility of a separately fired superheater in the control of steam temperature is apparent and is unequaled by any other means. In the Associated's steaming units the superheating is accomplished almost entirely by the application of radiant heat to the superheater tubes. This affords such a sensitive arrangement that precise control is obtained and the response is virtually instantaneous. Any quantity of saturated steam may be drawn directly from the steam drum while any desired amount of superheated steam, at any temperature up to 850 deg. F., is taken through the superheater.

		Design Specifications	*Bayonne to the Canal*	*Canal to San Pedro*	*Running on One Boiler*
Design Pressure	lb. per sq. in.	450	420	430	425
Temperature	deg. F.	725	720-725	720	725
Economizer Outlet	deg. F.	340	336-342	336-345	380
Stack	deg. F.	300	270-285	260-300	345
CO_2	Per cent	14	13.6-14.2	13.6-14.1	14.5
R.p.m.		85	84-86	86-88	85

The accompanying table shows the specification characteristics, based on a full speed of 85 r.p.m. of the propeller. Compared with the design specifications are the 24-hour averages as logged from the refinery at Bayonne to the Panama Canal, and the figures logged from the Canal to San Pedro (with the exception of the running time on one boiler, which is indicated in the last column). Many tankers built in the last few years have carried only two, high-efficiency, bent tube boilers. Although in several instances a single boiler has proved its ability to run these vessels at full speed, there is still some skepticism by those not familiar with such performances, especially where an entirely new design is concerned. The Associated was operated on a single boiler for a period of six hours during the run to San Pedro and the figures indicate the natural increase in stack temperature resulting from raising the load on a single steaming unit.

Operation of the Associated was at full speed. Full pressure and steam temperature were maintained without difficulty. Since this was the first voyage it was felt that after complete shakedown had taken place the records on single boiler operation would be even better.

It is interesting to note further that the speed of the tanker was reduced between San Pedro and San Francisco in order to schedule its arrival. Under these conditions one boiler was shut down and the ship was run at slightly above two-thirds speed on a single boiler much of the time, thus securing maximum performance.

Modern Sanitary Facilities For Workmen In Pacific Coast Shipyards

One of the most important means of increasing efficiency in modern industrial plants is the adequate provision of sanitary wash and locker rooms for employed personnel. Pacific Coast shipyards are discovering this fact and several notable examples of such facilities have recently been established. Our illustration shows one of the larger installations of washfountains, steel lockers, and steel partitions installed by Trask and Squier Company, Inc., of San Francisco at a San Francisco Bay shipyard. The lockers used are Worley Steel Lockers manufactured by Worley and Co., Pico, California.

Worley lockers combine strength of construction with thorough ventilation. The doors are equipped with a spring bolt automatic action latching device so that when they are pushed shut they will automatically latch in locked position.

As will be noticed in the illustrations these lockers are neatly finished, attractive in appearance and compact without sacrificing capacity.

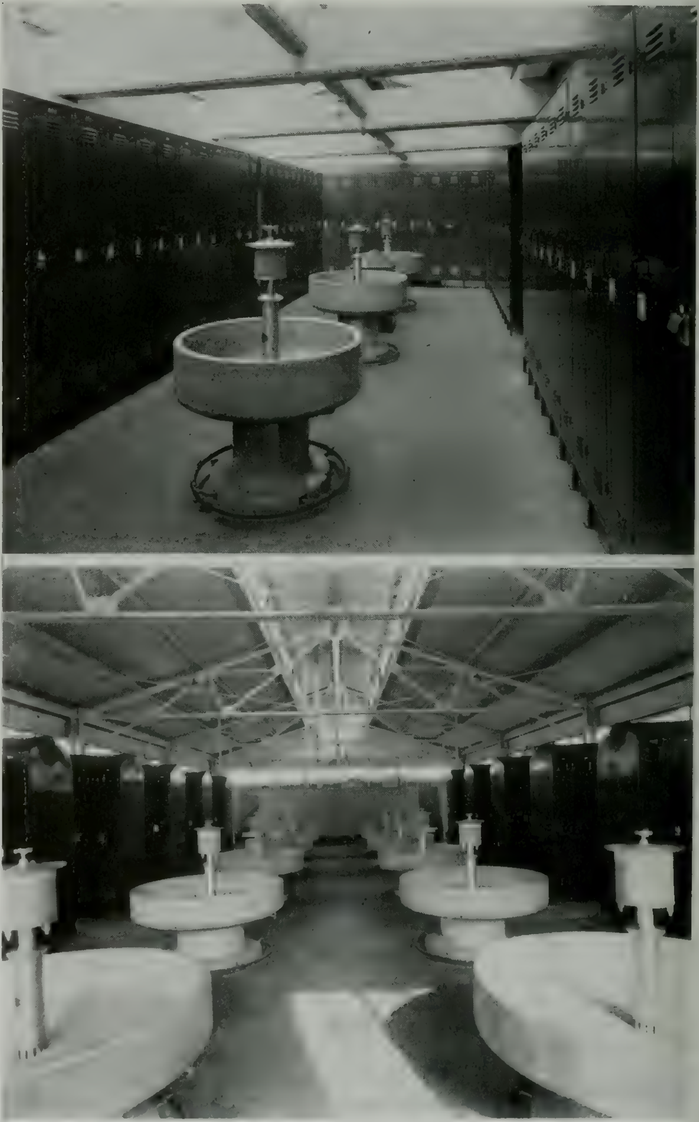
Seven hundred of these lockers were installed by this one shipyard in its modernization program. Thus every employee has a clean, secure compartment where his street clothes and personal belongings are kept safe and in a sanitary condition during working hours.

Worley & Co. are the only locker manufacturers on the Pacific Coast. They are equipped to take care of any locker problem and are ready to serve Pacific Coast industries.

Safety Quips

Then there was the safety conscious individual who carried a label tacked inside his coat, reading, "In case of accident this was Bill Jones."

And according to a schoolboy, "Artificial perspiration is something that is used to bring people back to life after they have just died."



Worley lockers in clean, sanitary washrooms are helping to maintain morale in the shipyard workers of the Pacific Coast.

TRADE and TRAFFIC NOTES

Sales Engineer For Worthington

Worthington Pump and Machinery Corporation have recently appointed M. J. Gigy as Pacific Coast sales engineer for their Marine Division, with headquarters in the San Francisco office.

Mr. Gigy has been a member of the Worthington organization since 1930 and has specialized in handling naval and merchant marine equipment, principally in the New York district.

A graduate of the University of Utah and a member of Tau Beta Pi, national engineering fraternity, he was formerly with the Bureau of Engineering, Navy Department, Washington, and later sailed on merchant vessels out of Pacific Coast ports.

Mr. Gigy is a member of the American Society of Naval Engineers and of the Propeller Club of California. He holds a commission as lieutenant (J. G.) in the naval reserve.

M. J. Gigy, new Pacific Coast sales engineer for Marine Division of Worthington.

Dr. Purdy Honored

The Association of Consulting Chemists and Chemical Engineers, Inc., the national professional society of independent consultants and research laboratories, elected Alvin C. Purdy of Bull & Roberts, consulting chemists, as their president for the coming year at their recent annual meeting. Since Bull & Roberts have specialized in the chemical problems of the marine industry since 1903, this recognition accorded their partner, Dr. Purdy, by his fellow consultants will be of particular interest to the firm's many clients in the marine field.

Bull & Roberts boiler water conditioning service is represented on the Pacific Coast by the Griffin Chemical Co. in San Francisco and Los Angeles, and by the Northwest Filter Co. in Seattle.

For the past three years Hall System of Boiler Water Conditioning has contributed largely to the safe regularity of service for which the transatlantic service of the Baltimore Mail Line was famous. Now that these vessels are operating on the Panama Pacific intercoastal service this same system, supervised by the Hall experts at New York and San Francisco, is largely responsible for maintaining efficient boiler performance and accurate ship schedules.

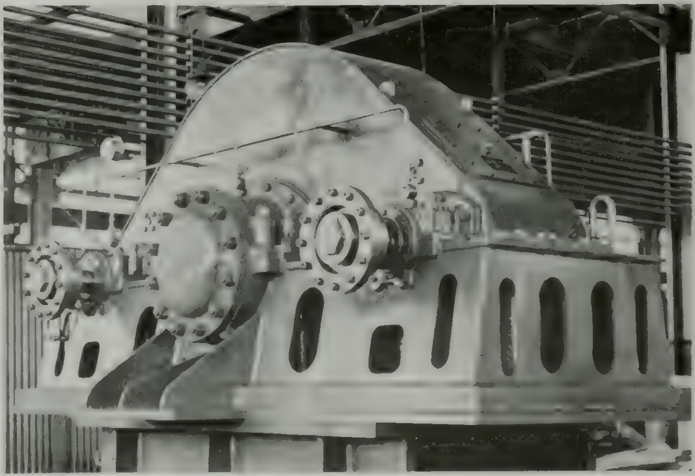
Hillcone Steamship Company, Ltd., as of August 1 have closed their uptown Los Angeles office and are now located at 305½ Avalon Boulevard. This company operates two steamers, S.S. Brandywine and S.S. Edwin B. De Golia. Both of these vessels are tankers and both are engaged in coastwise trade between Los Angeles Harbor, San Francisco Bay, Columbia River, and Puget Sound.

Fred H. Cordes is district manager for the Hillcone Steamship Company, Ltd., in Southern California.

Safety First

A temporary span over a small creek, located in the vicinity of Los Angeles, carries the interesting legend: "This bridge is unsafe. Only superintendents and foremen allowed to cross."

AN IMPORTANT CORRECTION



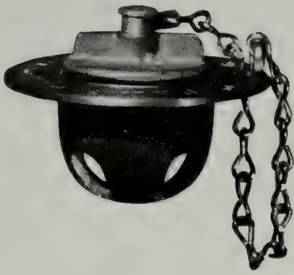
In our October issue an error was inadvertently made in the name of the manufacturer of the gear unit shown above for the diesel-electric tug Thomas E. Moran. This is a Farrel Drive made by Farrel-Birmingham Company, Inc., Buffalo, New York.

Pioneer Sheet Metal Firm Moves To New Quarters

After forty-eight years in one location on Steuart Street, San Francisco, the well-known pioneer sheet metal and pipe fitting firm of Morrison and Bevilockway have moved to new and larger quarters on Fremont Street. By careful attention to details and by prompt, efficient service, this firm has made many friends among the marine fraternity.

As a natural outgrowth of their sheet metal work on shipboard this firm has acquired a special skill in dealing with the natural ventilation of enclosed spaces. After careful study of the various automatic devices used to increase the efficiency of natural ventilation the firm decided to specialize on the Allen Multivane Turbine ventilator.

Many outstanding installations of this ventilator have been placed on Pacific Coast vessels by Morrison and Bevilockway. As an example, two 12-inch Allen Multivanes were installed on the Dollar liner President Cleveland. On a wind velocity of 4 miles per hour each of these ventilators delivers 38,600 cubic feet of fresh air per hour.



M. & B. drain plug for lifeboats.

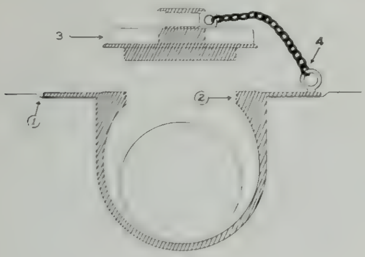
Morrison and Bevilockway have long been noted for expert lifeboat repairs. In connection with this department of its work the firm has developed and perfected and is exclusively manufacturing a new lifeboat drain plug.

The nature, outstanding features, and application of this plug can readily be seen in the illustrations herewith. The top of the plug is absolutely flush with the inner side of the bottom or keel strake of a metal lifeboat. This feature allows for maximum drainage of water over the entire inner surface of the bottom of the boat. Old style plugs are so constructed that the top is from ½ to ¾ inch above the inner surface of the boat's bottom, thereby allowing that depth of water to remain undrained on the bottom strakes and causing much corrosion and costly repairs, and replacement of keel and adjacent strakes. The use of the M. & B. plug reduces corrosion maintenance costs to a minimum.

Additional features of this plug are: the threads located inside the plug so that they are protected from damage; the fin provided on the cap for easy opening or closing; and the cap attached directly to the plug by a brass chain, thus insuring against loss. Every plug comes equipped with two caps. This plug has the approval of the Bureau of Marine Inspection and Navigation of the U. S. Department of Commerce.

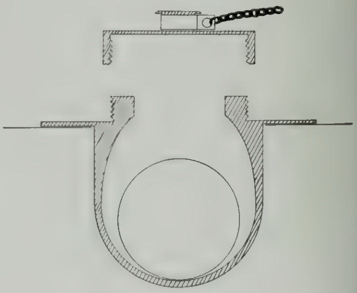
Many old timers on the San Francisco Embarcadero will recognize the new location of M. & B. just south of the new bridge terminal on Fremont Street as the former well-known Eureka Boiler Works building.

From this new location Morrison and Bevilockway extend greetings to their many friends and business associates and look forward confidently to prosperous years in the business of maintaining merchant fleets on the Pacific.



At left: M. & B. drain plug, showing construction and flush installation.

At right: Old style drain plug, showing projection above inner surface of boat's bottom.



On the Ways—

SHIPS IN THE MAKING

LATEST NEWS FROM AMERICAN SHIPYARDS

WORLD SHIPBUILDING POSITION

Lloyd's Register shipbuilding returns for the quarter ended September 30, 1938, show some rather interesting conditions. The shipbuilding nations of the world, with upward of 100,000 gross tons of merchant shipping on the ways, line up as follows:

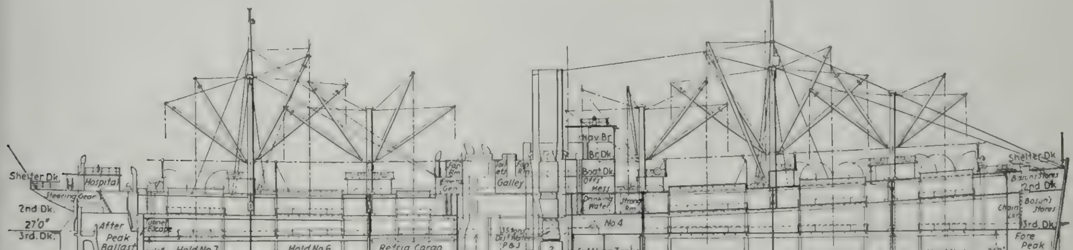
Great Britain and Ireland	183 ships, 885,481 tons
Germany	133 ships, 382,791 tons
Japan	69 ships, 319,862 tons
United States	**40 ships, 250,909 tons**
Holland	93 ships, 246,982 tons
Italy	22 ships, 153,485 tons
Sweden	24 ships, 116,950 tons
Denmark	19 ships, 111,690 tons

We note here that United States is in fourth place, that she is building a larger average size of vessel than any other nation except Italy, and that she is practically on a par with little Holland on total tonnage.

Lloyd's figures include only those ships on which actual work has been started in the shipyard. As we recorded in these columns last month, there were five American shipyards that had under construction or on contract forty-six seagoing vessels with an aggregate gross tonnage approximating 430,000. This figure includes only large seagoing ships.

The difference between Lloyd's figure and ours arises from two sources. First, some of the vessels under construction in these yards were delivered in September. Second, and most important, quite a number of the vessels on order were not yet under construction.

It is apparent from a comparison of these figures that if the U. S. Maritime Commission will vigorously press its replacement program the construction will have to go to other yards and probably to Pacific Coast yards. If this program had been resolutely spread out over all available yards the United States would now be second only to Great Britain among the world's shipbuilding nations.



Inboard profile and hold plan of four cargo vessels for Export S. S. Co. now building at the Fore River Plant of the Bethlehem Shipbuilding Corporation, Ltd.

Union Tanker Launching Scheduled

December 10 has been set for the launching at the Sparrows Point plant of the Bethlehem Shipbuilding Corporation, Ltd., of the new tanker for the Union Oil Company.

This vessel is scheduled to be delivered about March 15, 1939, and will arrive on the Pacific Coast early in April. Complete drawings and description were published in the June and October issues of Pacific Marine Review.

She will be driven by Bethlehem cross compound turbines taking steam from Foster-Wheeler water tube boilers fitted with B. F. Sturtevant forced draft blowers. Falk double reduction gears connect turbines with the propeller shafts. Kinney pumps driven by Whitton steam turbines will handle the cargo oil. Northern rotary pumps will transfer fuel and lube oils. Main boiler feed will be handled by Worthington pumps driven by Sturtevant turbines. All general purpose pumps will be motor drive Worthington. Two Westinghouse turbo generators will supply electric energy. Refrigeration units will be Carrier-Brunswick. The bridge equipment will include Mackay Radio, Kolster Radio Direction Finder, Sperry Gyro Compass, Sperry Gyro Pilot, Sperry Course Recorder, Submarine Signal Fathometer, and an electric sounding machine. American Engineering Company will furnish the steering engine and the deck machinery.

The chief point of interest in this tanker is that she will be the first tanker on the Pacific Coast built with the new Bethlehem-Frear system of fluted transverse bulkhead and connected longitudinal construction.

Lake Washington Gets Survey Ship

On opening the bids for a 1500 Coast and Geodetic Survey steamer for Pacific Coast service the Survey officials were confronted with a rather unusual dilemma. The low bids were:

Lake Washington Shipyards	$892,000
Commercial Iron Works	892,000
Maryland Drydock Co.	959,254

Lake Washington Shipyards are at Houghton, Washington; Commercial Iron Works, at Portland, Oregon. The bids were within the estimate. How were the officials to choose between these two, both perfectly competent to build the ship?

Contract for this ship has been let to the Lake Washington plant and work is now under way.

The ship will be 200 feet in length, 33 feet in beam, of steel construction, and powered with water tube boilers and geared steam turbines. Accommodations for 23 officers and a crew of 74 will be fitted. She will be named Explorer, taking the place of the wooden vessel of that name, a 34-year-old craft, which will be scrapped.

The contract price does not include her elaborate equipment for survey work. A total of $1,280,000 is available for the complete ship and equipment. Approximately 200 men will be employed in the yard at the peak of the construction work. The company now employs 70 men.

Bids for Twelve C-3 Type Ships Opened

U. S. Maritime Commission on October 18 opened bids for the construction of C-3 type cargo vessels of 11,926 tons deadweight and 16½ knots sea speed. There were six bids, ranging from $2,714,000 to $3,256,000 and averaging over $3,000,000. Only one bid, that of Bethlehem, contemplated construction in a Pacific Coast yard. Two Pacific Coast yards were known to be figuring on this work but were turned back through drastic requirements of the firms supplying performance bonds. An interesting feature is the entrance of Ingalls Iron Works as a bidder on ocean-going vessels.

The details of bids are as follows:

Sun Shipbuilding and Drydock Company, Chester, Pa. — Fixed price, one vessel, $2,789,000; two, $2,714,000 each; three, $2,689,000

CRAIG SHIPBUILDING COMPANY

LONG BEACH, CALIFORNIA

Builders and Repairers of Steel and Wooden Ships

Drydock Capacity
2500 Tons

HULL AND ENGINE
REPAIRS

✓ ✓ ✓

FULLY EQUIPPED
FOR
Diesel Engine Work

DRYDOCK — 12,000 TONS CAPACITY

LOS ANGELES SHIPBUILDING & DRYDOCK CORPORATION

SAN PEDRO, CALIFORNIA - - *Cable*: LASHIPCO

each; four, $2,676,500 each. Adjust price: One vessel, $2,614,000; two, $2,539,000 each; three, $2,514,000 each; four, 2,501,500 each.

Newport News Shipbuilding and Drydock Company, Newport News, Va.—Fixed price, one, $3,345,000; two, $3,145,000 each; three, $3,070,000 each; four, $3,025,000 each. Adjust price: One, $3,040,000; two, $2,860,000 each; three $2,790,000 each; four, $2,750,000 each.

Bethlehem Shipbuilding Corporation, New York. (Sparrows Point, Md., plant — Fixed price, one, $3,507,000; two, $3,256,000 each; three, $3,146,000; four, $3,100,000; five, $2, 972,000; six, $2,916,000. Adjust price: One, $3,188,000; two, $2,960,000 each; three, $2,860,000 each; four, $2,728,000 each; five, $2,702,000 each; six, $2,651,000 each. At Union plant in San Francisco: Fixed price, $3,442,000 each for two vessels. Adjust price: $3,129,000 each for two vessels.

Federal Shipbuilding and Drydock Company, Kearney, N. J.—Fixed price: One, $3,100,000; two, $2,879,300 each; three, $2,795,000 each; four, $2,694,265 each. Adjust price: One, $2,896,900; two, $2,691,300 each; three, $2,612,500 each; four, $2,518,275 each. For six vessels, fixed price, $2,614,000 each; adjust price, for six, $2,443,000 each.

Ingalls Iron Works Company, Birmingham, Ala.—Fixed price for four, $2,799,000 each; adjust price, $2,696,000 each. To be built in plants either at Pensacola and Panama City, or Pensacola, Miss.

Literature of the Industry

Diesel Engines, by B. J. Von Bongart; 335 pages, 346 illustrations; bound in blue bucram with gold stampings. Published by D. Van Nostrand Co., Inc.; $4.00 net.

The author of this volume is a New York consulting engineer specializing in diesel design and operating problems and much of the book consists of information assembled as a result of this work and experience. It is primarily designed as a textbook for students of the internal combustion engine of the compression ignition (diesel) type. Much of the modern research into various diesel engine problems is included in the text.

Chapter headings give an idea of the scope of the work. These are. History of the Diesel Engine; Thermodynamics; Combustion; Fuel Oils; Fuel Atomization; Fuel Pumps; Fuel Injection Nozzles; Common Rail and Air Injection Systems; Combustion Chamber Designs; Automotive Diesel Engines; Aircraft Diesel Engines; Medium and Low Speed Diesel Engines; Superchargers; Diesel Engine Design Features; and Miscellaneous.

This book should be of especial value to students and designers because it adequately treats all essential features of the modern diesel engine in a clear, concise style that admits no padding and yet gives a sense of complete coverage.

Diesel Engines Type S, a forty-page, profusely illustrated booklet published by Ingersoll-Rand.

The engine described and illustrated in this bulletin is a heavy duty, continuous-service, compact engine for stationary or marine-electric application.

It is a four-cycle, single-acting, solid-injection engine of the modern enclosed type, having complete force-feed lubrication, wet liners, shell bearings, and many other refinements. Of particular interest is the low fuel consumption of 0.38 lbs. per B.H.P. Hr. at full load. The fuel injection system has an individual fuel pump for each cylinder and there are two single-acting non-clogging nozzles per cylinder.

The Type "S" Engine is built in sizes of 3, 4, 5, 6, 7 and 8 cylinders, and rated at 175, 230, 290, 350, 405 and 460 B.H.P. respectively for 600 revolutions per minute.

The bulletin contains many illustrations of the engine parts, explaining the relationship of their design to the economical installation and operation characteristics of the unit. Several pages are devoted to application views on a variety of services in various parts of the world and to specifications, dimensions, cut-away views and other information.

SAFETY ON SHIPBOARD

A Section Devoted to the Creation of Safety Consciousness and Accident Prevention

REVISION OF RULES

Incorporating Safe Working Conditions on New Ships

On September 21 the Engineering Sub-Committee of the Ship Construction Safety Committee of the Accident Prevention Bureau of the Pacific Coast Waterfront Employers' Association met to discuss possible revision of the minimum standards recommended for machinery and machinery spaces.

These rules were carefully discussed and the following changes and additions were recommended:

(For full text of the recommended minimum standards see Pacific Marine Review, June, 1936.)

Rule 101 was amended by the addition of the following sentence:

"Where possible, bolts and nuts should be so installed as to minimize tripping hazards."

The entire rule as amended then reads as follows:

"All deck piping, flanges and connections shall be placed so as to be readily accessible for maintenance and also out of the usual path of travel. Pipe guards shall be constructed so as to completely protect the piping against damage from boarding seas, deck loads or any articles being handled in the course of the normal operation of the vessel. These guards shall consist either of solid steel plates with a sufficient number of freeing holes, steel bars or wooden battens, at least 3" x 3", secured not more than one inch apart; said plates, bars or battens shall be secured by means of bolts and nuts in order to facilitate removal in event of repairs or maintenance to the pipes.

"Where possible, bolts and nuts should be so installed as to minimize tripping hazards."

Rule 503 was amended by adding:

After the second word in the fifth line "or steel gratings." After the seventh word in line six "or steel gratings." The amended rule then reads as follows:

"Hinged covers, and the coamings, which extend above the level of the deck, shall be coated on both sides with aluminum or other color-contrasting paint to increase the visibility in semi-darkness. Flush manholes and access scuttles installed in a horizontal plane shall be equipped with wooden plugs or steel gratings for temporary closing when the manhole or scuttle is being used for frequent access. Said wooden plugs or steel gratings to be flush and fitted with handles, same as are used on wooden hatches."

Rule 803 was amended by inserting the word "auxiliary" after the sixth word in the first line. The amended rule then reads:

"Ladders, in trunks providing access to auxiliary machinery spaces, shall be permanently installed in such manner that their removal is not necessary when moving heavy weights through the trunk during repairs. Such ladders shall be offset at intervals of not more than two deck heights, each section terminating in a platform surrounded by hand rails."

The following rule, **No. 817**, was added to the Minimum Standards:

"An access ladder shall be provided at each manhole in all double bottom tanks which exceed 36 inches in depth."

Rule 903 was amended by adding the following sentence:

"These railings shall be installed on both sides of stairways and shall extend not less than 12 inches horizontally beyond the nosing or ledge of the lowest tread."

The amended rule then reads:

"All stairs and inclined ladders shall have strong hand-rails on each side secured to bulkhead or stanchions, and shall be equipped with treads non-slip in service.

"These railings shall be installed on both sides of stairways and shall extend not less than 12 inches horizontally beyond the nosing or ledge of the lowest tread."

Rule 2002 was amended by the insertion of the word "approved" after the ninth word in the first line.

The amended rule now reads:

Well-Deserved National Recognition

Advice has just been received from Chicago that Byron O. Pickard, manager of the Accident Prevention Bureau of the Waterfront Employers' Association of the Pacific Coast, has been elected as general chairman of the Marine Section of the National Safety Council. This is the first time that a representative of the Pacific Coast shipping industry has been so honored.

His selection by the members of the Marine Section as general chairman is in recognition of the outstanding group safety work which has been carried on in the Pacific Coast marine industry under the sponsorship of the Waterfront Employers' Association of the Pacific Coast and which has been so effectively directed by Mr. Pickard.

His many friends on the Pacific Coast will feel that this is a well-deserved recognition of a great piece of work carried on with marked success under unusually difficult circumstances, and the Marine Section of the National Safety Council will find that they have selected an ideal chairman.

Dependable
Insurance
Since 1863

Fire · Automobile · Marine · Casualty · Fidelity · Surety

FIREMAN'S FUND GROUP
Fireman's Fund Insurance Company — Occidental Insurance Company
Home Fire & Marine Insurance Company
Fireman's Fund Indemnity Company — Occidental Indemnity Company

Strength
Permanence
Stability

New York · Chicago · SAN FRANCISCO · Boston · Atlanta

"All line shaft couplings shall be completely enclosed with approved wire mesh guards which shall cover coupling bolts and nuts."

The Committee felt that the remainder of the rules were satisfactory as written.

The question of what can be done to keep licensed engineer officers and unlicensed personnel reminded that it is dangerous to enter any empty tank that has not been ventilated and made gas-free was brought up for discussion. It was suggested that manhole covers affording entrance to all such tanks should be painted some distinctive color with a warning painted on them. After some discussion, it was felt that as this was an operating matter rather than a construction matter it should be referred to the Steamship Operators Safety Committee for action.

USE YOUR GOGGLES!

Byron O. Pickard, manager of the Accident Prevention Bureau of the Waterfront Employers' Association of the Pacific Coast, writing in the September, 1938, issue of the Seaman's Safety Guide, warns seamen (which term, for purposes of safety, includes all ratings in all departments aboard ship) against carelessness in exposing their eyes to injuries. We quote in full:

"Given a choice, any man who had to work for a living would sacrifice any part of his body to save his eyes. Eyes provide the impetus for 90 per cent of man's movements, actions and thoughts. Seeing is his most prized and least appreciated sense. But how often does an unlicensed seaman, or licensed officer for that matter, think of his dependency on eyesight, or on the difference between perpetual darkness and light? Certainly many often expose their eyes to possible injury without a thought to the fact that only by the grace of an unseen power they are still seeing and still working.

"Most accidents causing injuries to eyes are probably more truly unpreventable than any type of accident to which a seaman is exposed.

"But when any industrial hazard is difficult to control, devices or guards protecting against injury or reducing the amount of exposure to the hazard are usually available. So we find that even if the accidents cannot be prevented the resulting injuries to eyes are most easily avoided by wearing the modern scientific industrial workers' goggle that is now on the market.

"A study of the 1937 accidents resulting in injuries to seamen reveals that the most common type of accident resulting in injuries to the eyes of seamen is 'Flying Objects.' A seaman exposes his eyes to the flying object hazard whenever he chips paint, rust, concrete, etc., or for that matter whenever he uses a hammer or chisel, or just a hammer for scaling; whenever he uses the emery wheel; whenever he uses the lathe; whenever he blows boiler tubes; whenever he scales boilers; whenever he uses welding equipment; whenever he works over the galley range; whenever he works with liquids that are liable to splash; whenever he works with dusty materials.

"During the year 1937—111 seamen eye injuries, resulting from flying objects, were reported to the Bureau. These injuries, some minor and some severe but all potentially dangerous, were received because men in the deck, engine and steward's departments failed to properly protect their eyes while working in the presence of the flying object hazard.

"It is believed that on all of our American ships there is a sufficient supply of standard goggles available for the use of the personnel, but the mere presence of goggles aboard ship will not prevent injuries. The proper type of goggles must be issued to and worn by the personnel at all times when engaged in work wherever there is a possibility of flying particles. They must be worn over the eyes no matter for how short a period the wearer will be exposed.

"Ships' officers who expect to enforce a rule that goggles must be worn when doing certain types of work must themselves obey the rule. In a recent case a first assistant engineer was attempting to show a deck engineer how to chip gears on a winch. The tools were in good condition but the instructor forgot the rules about goggles—he took a

Marine Insurance in All Phases — "All Risks" . . . Inland Marine . . . Ocean Marine

STANDARD MARINE INSURANCE COMPANY, LIMITED
NATIONAL UNION FIRE INSURANCE COMPANY
MERCANTILE INSURANCE COMPANY OF AMERICA

GEO. E. BILLINGS CO.

Pacific Coast General Agents—Richard J. Lutich, Marine Manager

GArfield 3646
308 California St.
SAN FRANCISCO

TRinity 1521
Spreckels Bldg.
LOS ANGELES

SEneca 1478
Colman Bldg.
SEATTLE

MARINE DEPARTMENT
AETNA INSURANCE CO.
QUEEN INSURANCE CO.
MARITIME INSURANCE CO., LTD.
FIDELITY PHENIX FIRE INS. CO.
Commercial Hull Dept.
AUTOMOBILE INS. CO.

MATHEWS & LIVINGSTON
Marine Underwriters
200 BUSH ST. SAN FRANCISCO
Offices at: Colman Bldg. - Seattle 111 West 7th St. - Los Angeles

chance with the result — inevitable to chronic chance-takers, that the law of averages caught up with him.

Sterilize All Goggles

"There does not seem to be a realization among seamen of the necessity for sterilizing goggles after they are worn nor any knowledge of how easily this may be accomplished. A thorough scrubbing in soap and hot water every time after the goggles are used, and a washing of the goggles every two weeks in a 10 per cent lysol solution, or a bath in a solution containing three teaspoons of 40 per cent solution of formaldehyde in a quart of water will suffice. After washing, the goggles should be allowed to dry in the air—they will dry quickly and will cause no irritation to the eyes. Sterilization is necessary in order to prevent the transmission of communicable eye infections and diseases from one man to another.

"There appears to be the impression aboard ships that goggles are goggles, and any old type will do. This, however, is not true, and as specific types of goggles are made to guard against specific hazards the proper type should be selected and none other used.

"Satisfactory goggles must embody such features as comfort, clear and wide angle of vision, protection against impact, freedom from eye strain, minimum of fogging and permit of positive sterilization. Minimum standards for goggles have been prescribed by the Accident Prevention Bureau to cover the features of a satisfactory goggles. These standards are available upon request.

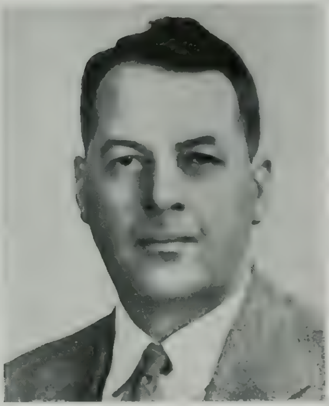
"The hazard of flying objects exists; exposing the eyes to the hazard seems to be necessary; it is not reasonable in this instance to change the method of doing a job to eliminate the hazard. But it is reasonable and practicable to protect the eyes by the wearing of goggles capable of being worn with comfort and giving positive assurance of protection."

For this excellent photograph of the Lauritzen Line motor refrigerated cargo carrier Egyptian Reefer we are indebted to L. L. Westling.

Running Lights of Pacific Shipping

COL. W. C. BICKFORD

Col. Bickford, General Manager and Chief Engineer, Port of Seattle . . . received his engineering education in South Dakota. Came West in 1907 and engaged in highway, railroad, construction work. As Snohomish County Engineer, laid some of the state's first pavement. Entered World War service with 63rd Coast Artillery as Captain. Returned home as Lieut. Colonel. For 10 years head of a building materials business in Seattle . . . served as chairman Adjudication Board . . . president, Seattle Construction Council . . . Supt. of Buildings . . . Consulting Engineer for Pacific lumber interests. Became General Manager of the Port in January, 1935. He has so administered Seattle's maritime affairs to win respect and esteem of men throughout the Coast.



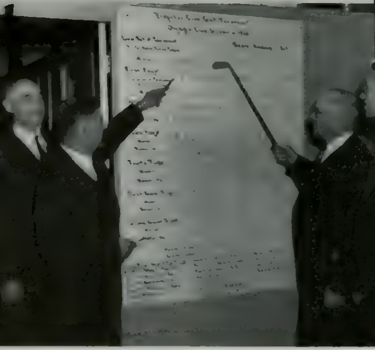
HANS HALVORSEN

Hans Halvorsen, Port Captain for Union Oil Company of California, first became associated with the company in 1914, when he was signed on as a seaman on the S.S. Lansing. During his next three years at sea, in various capacities and on various vessels of the fleet, he utilized his spare moments so effectively in study that by 1917 he had received his mate's license. Immediately thereafter he was assigned as third mate to the S.S. La Brea, and by 1919 had risen to the position of first mate on the S.S. Los Angeles. His first appointment as master was on the S.S. Warwick, when she was taken over by Union Oil Company from the U. S. Shipping Board in 1923, and for a number of years subsequently he served as relieving master on other vessels of the fleet. He was appointed to his present post—Port Captain—on January 10, 1927.

GEORGE EGGERS

George Eggers was appointed last month to the post of Examiner for the occupational research division of the United States Maritime Commission at San Francisco. The naming of this Coast-reared, Coast-trained marine man was hailed by his friends up and down the seaboard . . . friends who knew him back in the old Pacific Mail days . . . friends who have followed his career through the years. His background in capsule form: Joined Grace in '05. Worked with John Rosseter from '14 to '18, on U. S. Shipping Board. Operating Manager of "Mail Company" till '21. Thence to Norton, Lilly & Co., at Puget Sound and Columbia districts . . . '23 to '26. Operating Manager of States Steamship and finally, ahead of U. S. M. C. appointment was operating manager of Sudden & Christensen at San Francisco. Born in Alameda . . . and still resides there! His hobbies are ships and the men that run them.

PMR Goes to a Propeller Party



Jpper Left:
Turf-tossers Pruner, Keeler, Staples, Harring-
on. Henry, and Clerico.

.eft Center:
Harry Haviside telling Prexy LeCount: "Well,
nyway, a Haviside turned in a net 73. I taught
Russell all I know about the game!"

.eft Lower:
Dad LeCount beams as his hard-working com-
mittee-men survey the results. Vernon Showell,
Gene Essner and Julian Arntz.

Upper Center:

Dan Harrington, big machine tool man, wistfully examines the Pacific Marine Review trophy. He didn't win it!

Locker-room post-mortem by Mike Rhine, Charles Stoeckly, F. I. Kemp, Bob Spear.

Upper Right:

No. 1 man Les Moody who did it again! A net 71 engraves his name on P.M.R. perpetual trophy. Julian Arntz and Chairman Gene Essner pose with him.

Russ Pratt congratulates Arthur Forster for a net 82. That's Russ with the handkerchief.

A round-table discussion of "ships-kings-sealing wax." Seated are Russell Haviside, Charles Dilke, George Schimer, Al Papworth. The "Kibitzers": W. Eddie Martin, George E. Swett and Paul Faulkner.

Propeller Club of California News

The fall golf tournament—an annual event of the Propeller Club of California—was held at Lakeside on October 6.

E. F. ("Gene") Essner chairmanned the big affair, with **Vernon Showell, Julian Arntz, Frank De Pue** and **Carroll Reeves** as aides.

The banquet, which topped off an afternoon of scintillating play, was the traditional joyous get-together. **P. M. R.'s** camera caught some of the locker room scenes . . . as depicted on the facing page . . . and rather good photography when you consider that the air was foggy with alibis and harrowing details.

Here are the prize winners:

	Score	Handicap	Net
Low Net of Tournament			
(Pacific Marine Review Trophy)			
Winner "Les" Moody. . . .	88	17	71
FIRST FLIGHT			
(Jack Young Trophy)			
Low Gross of Tournament			
Winner—A. J. Donnelly..........	79		
Low Net Brace Carter	86	11	75
SECOND FLIGHT			
Winner F. DeBenedetti	86	14	72
Runner-up—R. H. Haviside....	**87**	**14**	**73**
THIRD FLIGHT			
Winner—E. F. Essner	**101**	**20**	**81**
Runner-up R. A. Forster	104	22	82
2nd Runner-up O. Langton	105	23	82
FOURTH FLIGHT			
Winner J. Clerico	103	26	77
Runner-up—W. M. Laughton..	**116**	**28**	**88**
FIRST GUEST FLIGHT			
Winner—D. Harrington	**82**	**13**	**69**
Runner-up—A. L. Papworth..	**83**	**10**	**73**
SECOND GUEST FLIGHT			
Winner M. Rhine	97	21	76
Runner-up F. Kemp	104	25	79

The committee tells us that the firms who were asked to contribute prizes were most generous. A large number of them donated cash, which gave our committee the desirable latitude in selecting and assigning prizes. One very generous donor insists on remaining anonymous. We are very grateful to all of them. The contributors follow:

Martin Ship Service Company, Sperry Gyroscope Company Matson Navigation Company, General Petroleum Corporation, Moore Dry Dock Company, Louis Weule Company, General Engineering and Dry Dock Company, Bethlehem Shipbuilding Corporation, Ltd., American-Hawaiian Steamship Company, Haviside Company, C. J. Hendry Co., Westinghouse Electric and Manufacturing Company, E. D. Bullard Company, General Electric Company, Union Oil Company, Socony Paint Products, Swayne and Hoyt, Ltd., Columbia Steel Company.

• Luncheon Programs in Review

We have just returned from the Navy Day Observance, as sponsored by the Propeller Club in cooperation with the Navy League, the C. C. Thomas Navy Post of the American Legion, the Army and Navy Club and the National Defense League.

The main dining room of the San Francisco Commercial Club was brightly bedecked with flags of maritime nations. Present at the speakers' table were leading naval and merchant marine figures.

Propeller president **C. M. Le Count** introduced chairman **Walter J. Walsh,** who in turn presented guest speaker **Harrison S. Robinson,** whose subject was "Our Navy After Munich."

Speaker Robinson traced the history of America's merchant marine, emphasizing its vital relationship with naval defense, and warning his listeners of the necessity of rebuilding renewed interest on the part of the average citizen in ships and shipping.

• October 11 Program

Joseph R. Sheehan, executive director of the U. S. Marine Commission and president-elect of the reorganized Dollar Line, addressed the club on October 11. Attendance broke all 1938 records.

The speaker based his remarks on his observations of West Coast shipping as a director of the Commission.

"I want you gentlemen to know," said he, "that the Coast Range is being given every consideration," citing examples of subsidy awards already made to Pacific Lines . . . the allocation of the five ships to the intercoastal trade.

Complete abstract of Mr. Sheehan's speech appears as a feature in this issue of Pacific Marine Review (see page 29).

George E. Swett was "head man" at the final September meeting. A good choice! Chairman George presented **George Barr** of the G. E. Company in San Francisco, who spoke on "The Operation of Marine Turbines."

"There is no reason why America should not lead the world in ship design. We have the talent, the initiative and a wealth of materials," said Mr. Barr in referring to the great improvements in recent years.

"Land jobs are designed and built to run eighteen months with the throttle open. Marine turbines can be built just as skillfully.

"The next trend is going to emphasize ruggedness. We'll build them so we won't have to open them up for five or six years. Then we'll be getting somewhere!"

Mr. Barr's description of his experience aboard a destroyer making its first sea voyage was a classic. The vessel encountered a typhoon! So vivid was the speaker's accounting that he was held overtime by his audience clamoring for more stories.

A feature of the day's program was a drawing for a guest flight over San Francisco Bay awarded through the courtesy of United Air Lines. The lucky man was Paul Faulkner, ace publicity man of the club!

FRED R. ALTMAN

Fred R. Altman of the Bureau of Marine Inspection and Navigation, San Francisco office, has been appointed local inspector at Honolulu.

Mr. Altman has a host of friends among the marine engineers of the West, who all wish him the best of success with his new responsibilities.

His steady climb from an apprentice machinist in 1914 to his present station is worth noting. A full-fledged machinist in 1918, he went to sea with the Admiral Line and after several trips to the Orient obtained his 3d assistant engineer's license in 1919. His first berth on his new ticket was with the Matson Line in 1921, where he stayed until he obtained his other licenses and sailed as chief.

Married in 1928, his first shore job was with the Hartford Steam Boiler Insurance Co. as inspector in their San Francisco office. This job he held for seven years, until in August, 1936, he was appointed by the Department of Commerce as inspector in the San Francisco office.

All Aboard for the Thirteenth Annual Steamship Dinner!

Ralph W. Myers, president of the Shipowners Association of the Pacific Coast, heads up as general chairman the big organization which is staging the Thirteenth Annual Steamship Dinner. The date — November 5. The place—the Gold Ballroom of the Palace Hotel.

Edward H. Harms, assistant operating manager of McCormick Steamship Company, is the busy secretary of the affair.

The personnel of the several committees is as follows:

Dinner — Donald Watson, chairman, Interocean Steamship Corporation; Jos. A. Moore, Jr., vice-chairman, Moore Drydock Company; W. E. Dooling, American Hawaiian Steamship Company; A. J. Pessel, Matson Navigation Company; L. P. Bailey, Balfour-Guthrie Company; Captain Walter Gay, Bank Line; Lloyd Swayne, Swayne & Hoyt; Cyril Meek, Bay Cities Transportation Company; A. K. Hulme, General Steamship Corporation; J. J. Coney, Hillcone Steamship Company; Dearborn Clark, American-Hawaiian Steamship Company; F. H. Fox, General Engineering & Drydock Company.

Finance—K. C. Tripp, chairman, North German Lloyd; Philip Brown, vice-chairman, Bank Line; C. J. Euson, Luckenbach Steamship Company; L. C. Stewart, Sudden & Christenson; F. L. Doelker, Grace Line; J. C. Van Meurs, Blue Star Line; J. J. Walsh, Furness Line; H. H. Pierson, Williams-Dimond Company; E. F. R. DeLanoy, Holland-American Line; Ralph Sullivan, Norton, Lilly & Co.; Fred Adams, Hammond Shipping Company; W. J. Edwards, Jr., Norton, Lilly & Co.

Membership — W. C. Empey, chairman, The Guide; Geo. A. Armes, vice-chairman, General Engineering & Drydock Company; Guy E. Buck, Grace Line; Geo. J. Yater, Pacific Coast European Conference; P. M. Holway, Holway Steamship Company; M. F. Cropley, Matson Navigation Company; W. E. Usher, Calmar Line; A. S. Gunn, Bethlehem Shipbuilding Corporation; Charles L. Wheeler, McCormick Steamship Company; H. H. Brann, Haviside Company; Chr. Jensen, East Asiatic Company; Gilbert Macqueron, French Line.

Entertainment — R. S. Norton, chairman, Sudden & Christenson; Ray Ingram, vice-chairman, Union Oil Company; H. E. Hornung, N. Y. K. Line; T. E. Cuffe, Dollar Steamship Lines; T. C. Greene, Norton, Lilly & Co.; K. M. Rutger, Mississippi Valley Barge Line; Ray Windquist, General Steamship Corporation; R. F. Burley, McCormick Steamship Company; F. W. Kutter, Fred Olsen Line; W. R. Chamberlin, W. R. Chamberlin Company; Chr. Blom, Klaveness Line; R. A. McLaren, Williams-Dimond Company; Armand de Pichon, French Line.

Reception — Philip A. Coxon, chairman, Moore Drydock Company; John E. Cushing, vice-chairman, American Hawaiian Steamship Company; T. A. Ensor, Kerr Steamship Company; Norvin Fay, The River Lines; A. B. Johnson, Jr., A. B. Johnson Company; Erik Krag, Interocean Steamship Corporation; J. A. Lunny, McCormick Steamship Company; George K. Nichols, Matson Navigation Company; Franz Schulze, Hamburg-American Line; Cornelius Winkler, Transpacific Transportation Company; J. A. McEachern, Standard Oil Company; R. C. Robinson, Hammond Shipping Company.

Publicity—Gene Hoffman, chairman, Dollar Steamship Lines; Ben Foster, vice-chairman; Lewis Lapham, American-Hawaiian Steamship Company; Robert Robb, General Steamship Corporation; Geo. Martin; Les Comyn, Jr.

Honorary Operating Committee—Past general chairmen: Harry Scott, General Steamship Corporation; John C. Rohlfs, Standard Oil Company; Hugh Gallagher, Matson Navigation Company; Thomas Crowley, Shipowners & Merchants Tugboat Company; Harry Evans, E. C. Evans & Sons; M. J. Buckley, Dollar Steamship Lines; R. W. Bybee, McCormick Steamship Company; Roger Lapham, American Hawaiian Steamship Company; C. H. Chandler, Sudden & Christenson.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACTS OF CONGRESS OF AUGUST 24, 1912 AND MARCH 3, 1933 Of Pacific Marine Review, published monthly at San Francisco, California, for October 1, 1938.

State of California, County of San Francisco.

Before me Edith Goewey, Notary, in and for the State and county aforesaid, personally appeared Bernard N. DeRochie, who, having been duly sworn according to law, deposes and says that he is the Business Manager of Pacific Marine Review, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor and business managers are:

Publisher, Jas. S. Hines, 500 Sansome Street, San Francisco, California.

Editor, Alex J. Dickie, 1035 Mariposa Ave., Berkeley, Calif.

Managing Editor, None.

Business Manager, Bernard N. DeRochie, 500 Sansome St., San Francisco, Calif.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address as well as those of each individual member, must be given.) Jas. S. Hines, Owner.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securtiies than as so stated by him.

Bernard N. DeRochie,
Business Mgr.

Sworn to and subscribed before me this 21st day of September, 1938.

Edith Goewey,
Notary Public in and for the City and County of San Francisco, State of California.

(My commission expires November 22, 1940)

A Young Veteran of Coastal Seas

As shipmasters in command of important vessels go, **Capt. Thomas Cliffe,** master of the Vancouver-Victoria-Seattle ferry Princess Kathleen is a young man—in his very early 50's, but the tall, rugged skipper can lay claim actually to 32 years of continuous service with the Canadian Pacific's highly regarded and world renowned British Columbia Coast steamships.

In addition, he is a native son who "made good," for he was born near Comox, Vancouver Island, and fell naturally into a seagoing habit of life.

In 1906, less than a year after the Canadian Pacific acquired the Esquimalt & Nanaimo Railway and its marine interests from the Dunsmuir family, he was running deckhand on the former Dunsmuir collier City of Nanaimo, a ship which was also the starting place of such other well known B. C. shipping men as Capt. Tom Rippon, now marine superintendent of the C. P. R. coast fleet at Vancouver.

Tom Cliffe was a big, active, rawboned, likely-looking lad and he had no trouble impressing himself on his superiors. He recalls that one of his first jobs on the City of Nanaimo was to paint her funnels buff to the Canadian Pacific shade.

Soon, however, he was quartermaster in the City of Nanaimo, later her third mate, holding this berth during the summer rush but reverting to quartermaster in winter off-seasons.

The old steamer Amur claimed him subsequently for a while, and then he reported for duty as third mate of the Princess Victoria, then under command of that colorful Newfoundland Irishman, Capt. Hickey. "There's been noine men ahead of yez in this berrth, me foine bucko" he told young Cliffe, "and all of them have been foired. So now yez know what koind av a job it is!" Cliffe stayed.

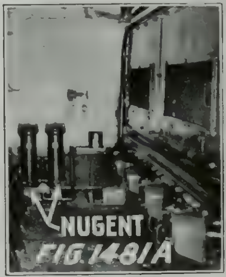
Capt. Cliffe was in the Princess Sophia when she made her first trip to Alaska in pre-war days, and went into the Princess Alice when that ship was added to the fleet.

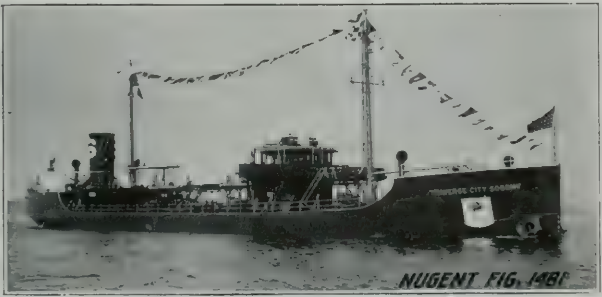
He became skipper of the Princess Alice in the Alaska trade in 1923, and in 1929 took over the Princess Elaine, speedy Vancouver-Nanaimo turbiner. Intermediate spells on the Triangle run and Vancouver-Victoria night run occupied him along with the Princess Elaine until 1933 when he took over command of the Princess Kathleen, succeeding Capt. Tom Rippon who went ashore at Vancouver as marine superintendent.

NUGENT LUBE OIL FILTER

PROTECTING . . .

NORDBERG 750 H. P. DIRECT DRIVE DIESEL ENGINE
Aboard TANKER "TRAVERSE CITY SOCONY"





Nugent Oil Filters
are seen
Against The Back Wall
They Have
20 Times More Filtering Area
(P't'd.)
Don't Weigh As Much
Don't Occupy As Much
Space
Don't Cost Any More
Than Most Filters.

Send For Bulletin 7A
BUILT IN 8 SIZES FROM 1 TO 130 G.P.M.

NUGENT TRADE MARK

Wm. W. Nugent & Co., Inc. Mfrs.
Oil Filters, Oiling and Filtering Systems, Telescopic Oilers, Oiling Devices
Sight Feed Valves, Flow Indicators, Compression Union Fittings, Oil Pumps, Etc.
422 N. HERMITAGE AVE. Established 1897 CHICAGO, U. S. A.

NUGENT TRADE MARK

Represented by THOS. A. SHORT, 1 DRUMM ST., SAN FRANCISCO, CALIF.

New Chairman and President for Union Oil Named

L. P. ST. CLAIR

At the regular meeting of the board of directors of Union Oil Company of California, held recently, **L. P. St. Clair,** for eight years president of the corporation, asked to be relieved of his presidential duties.

Mr. St. Clair was then elected chairman of the board of directors and in that capacity will continue actively in the affairs of the organization. **Reese H. Taylor** was elected as his successor.

Always a valiant champion of the small producer of oil, Mr. St. Clair was one of the organizers of the Independent Oil Producers Agency and has been its president for more than thirty-one years. During the war he served as a member of the Pacific Coast War Service Committee and later helped to organize the American Petroleum Institute, acting as vice-president at large for several years.

He identified himself with the Union Oil Company in 1909 and has been a director since 1920. He was elected vice-president two years later and became the fifth president of the corporation following the death of W. L. Stewart in 1930.

Mr. Taylor was elected to the board of directors of Union Oil Company in 1937 and has had varied experience with other business concerns. He is president of the Consolidated Steel Corporation, Ltd.; also a director of Pacific Finance Company, Douglas Aircraft Corporation, Pacific Indemnity Company and Gladding McBean and Company. He is at present a director of the Federal Reserve Bank of San Francisco.

No other changes in organization were made.

REESE H. TAYLOR

U. S. M. C. APPOINTS SCHELL

The United States Maritime Commission has announced the appointment of **S. Duvall Schell,** one of the assistants to the Commissioners, as Acting Executive Director. Mr. Schell succeeds **Joseph R. Sheehan,** who resigned to become president of Dollar Steamship Lines, Inc., Ltd.

R. H. SHAINWALD

INDUSTRIALIST IS MARINE-MINDED

R. H. Shainwald loves the sea. The companies he represents are among the mainstays of the Coast maritime industry. He is vice-president of The Pabco-Paraffine Companies, Inc., makers of marine paint; president of Plant Rubber and Asbestos, manufacturers of magnesia and rock wool insulation and mechanical packings of all kinds; president of Vitrefrax Corporation; president of Schumacher Wall Board Corporation.

His hobby is water sports—especially speed-boating.

At the outbreak of hostilities in the World War he volunteered in the French army. Transferred to the American army when the United States entered the war, he worked his way up from the ranks to officership.

Started in at the bottom in Pabco offices, then to rock bottom work in the factories in 1914 and worked his way up slowly by dint of industry and ability.

The Ad Man's Page

We Make Our Bow!

Back in the old bean for some little time now has been the idea that a page in Pacific Marine Review should be set aside for us fellows in the ad department.

A "crass commercial" page! . . . because we're a crass commercial department!

Our job is to get the Pacific marine buyer together with the firm which has something he needs. "How about it!" we asked Publisher Jim Hines, leading with the chin.

Publisher Jim is a pretty good "merchandiser" himself. "Anything and everything we can do to help our advertisers SELL. That's the ol' slogan!" was his reaction. So . . . here's the page.

Welcome Friends!

May we introduce a few new advertisers! Gentlemen — we present Morrison & Bevilockway of San Francisco. Like the after-dinner toastmaster says: "They need no introduction, as they're well known to all of you," M & B have been familiar names to the San Francisco marine personnel for 48 years.

Arthur Bevilockway heads up the firm. They do ship plumbing, ship steam-fitting, and sheet metal work. Their jobs are exclusively **Marine.** "We've never done any 'up-town' work," as Arthur puts it. "The Embarcadero is our stamping ground." For 47 years a land-mark on Steuart Street; along came the new post office a few months ago and M & B moved lock, stock and barrel over to Fremont Street.

Give them a "look-in" on your next job, will you? They've a fine reputation.

William W. Nugent & Co., Inc., manufacturers of Nugent lube oil filters, make a bid for your consideration with a half page display on page 63.

Tom Short is the sales representative here in San Francisco and he'd rather sell Nugent filters than . . . well, we were going to say "eat" . . . but Tom likes a sanddab as well as the next fella. Tom is doing an A-1 job getting this line aboard our West Coast ships. He can tell you all the details . . . such as "less weight, less space, less cost."

Interested?

Todd Combustion Equipment, Inc., are announcing the new Todd variable capacity mechanical pressure, atomizing burner on page 17 this month. Here's a development which will intrigue all you good steam-operators and engineers.

"If you have a combustion problem—look to Todd for the answer!"

The man in San Francisco who knows all the answers is your old friend **Louis Siversen** of **Columbia Machine Works.** Down in Los Angeles the Todd Burner man is **O. A. Tucker** . . . an old Todd from Tacoma-Seattle.

We're proud of our lead-off page this month. The Moore Dry Dock Company designed the copy . . . utilizing a very striking photograph of their Oakland yard by Gabriel Moulin. To the executives of Moore's our thanks for one of the most attractive pages in this volume.

Scanning the Ad Copy!

You'll linger over the magnificent 2 pages devoted to G. M. Diesels way up there in the front of the book. Note the "fire fighter" theme. The kind of plates which make a publisher's heart rejoice! They were designed by Arthur Kudner, Inc., New York advertising agents. By the way, the long established Winton trade-name appears as part of the General Motors program, ingeniously linked with the new G. M. design . . . with the reference "Formerly Winton."

We were intrusted with the first piece of advertising copy released by the newly named American President Lines. Received it right under the wire as this issue was "going to bed." Incidentally, we had to work fast to get that front-cover caption correct. The big news of the new name of the Ex-Dollar Line broke Monday afternoon, October 31. The cover ran that night!

Effective use of one-quarter page space . . . that **Fuller Paint** plate on page 67. Designed by McCann, Erickson Company . . . the ad agency that prepares those good-looking **Standard Oil** displays.

We like the **Westinghouse** tie-in this month with the Coast's very own tanker, the William H. Berg.

There's a prescription for rehabilitation . . . "to be taken internally" . . . on page 71.

The **Texaco** copy is always a thrilling surprise to us here in the back room. This month's plates again follow the **Texas Company's** theme of featuring ships in Pacific Ocean Service. We imagine there have been close to one hundred vessels over the years covered in the Texaco programs in Pacific Marine Review. We mean to count 'em some day!

And **that's** a lot of lube oil!

Signing Off!

Well—we're down to the end of the page and we'd better sign off till next month. Meanwhile—give a thought to all loyal Pacific Marine Review advertisers. Remember they're interested in your problem of doing your job better—more efficiently—more economically.

Thank you, gentlemen!

The Ad Man

JOHN A. BECKWITH

In Portland recently, John A. Beckwith was named a member of the State Board of Pilot Commissioners to succeed the late Nelson W. Hibbs, who died a short time ago at Portland. Mr. Beckwith is state commander of the American Legion and commander of the naval reserve in Oregon. Governor Charles H. Martin appointed him to his new post.

DOLLAR FAR EAST PERSONNEL CHANGES

While in San Francisco the latter part of October, **O. G. Steen,** vice president in charge of Oriental operations of Dollar Line, announced the resignation of **H. M. Cavender**, general agent at Manila, effective on October 31. Mr. Cavender will be replaced by **W. T. Goodwin,** general agent for the line at Singapore, who in turn will be replaced in that post by **G. H. Blyth.**

Mr. Cavender has accepted another position in the Far East.

CARL ROBINSON

From Seattle comes word of the death in that city of **Carl Robinson,** northwest manager for Swayne & Hoyt, at the age of 69. Mr. Robinson passed away on October 21 after a long term of service with the company, which he joined in 1923, going into the accounting department in the San Francisco office. In 1932 he was transferred to the Puget Sound territory, thence to Portland, thence back to Puget Sound.

Before his connection with Swayne & Hoyt, Mr. Robinson was connected with the Great Northern at Seattle, from there going into the Vancouver office of the company. He left the company to join in the rush of Klondike gold seekers.

W. DEARBORN CLARK

At a recent meeting of the board of directors of American-Hawaiian Steamship Company, W. Dearborn Clark was elected a vice president of the company, also retaining his present title of traffic manager.

He is the son of the late Warren Clark, one of the founders and first of the first vice presidents of the line. He was born in San Francisco, graduating from Williams College. When the World War broke out he organized a French Ambulance Corps composed of American college youths, which served in the French army for the duration of the war. When the Armistice was signed, Mr. Clark joined Williams, Dimond & Company, then Pacific Coast agents for American-Hawaiian. He later served as assistant district manager for American-Hawaiian at New York and Boston, returning to San Francisco in 1926 as assistant traffic manager. In 1930 he was appointed Pacific Coast traffic manager, and in 1935 was given the post of traffic manager.

JOHN F. CRAIG

On September 1 John F. Craig, Long Beach civic leader, pioneer shipbuilder and founder of the Craig Shipbuilding Company, resigned from the Long Beach Harbor Commission owing to ill health.

A formal resolution paying tribute to Mr. Craig for his service record was adopted at the meeting of the Long Beach Board just before his retirement became effective. He was a member of the Commission since its inception, serving six years as president, and has contributed materially to the development of the Long Beach section of the harbor.

Lynn O. Hossom, attorney, has succeeded to the post left vacant by Mr. Craig.

Norman Wallingford has recently been appointed by **Greene-Tweed & Co.** as Western Representative of these manufacturers of Palmetto packing, Basa hammers, and other Greene-Tweed products.

Norman Wallingford.

Headquartered in Los Angeles, Mr. Wallingford will have supervision of the entire Western distributing factors.

A new selling set-up in the marine field is the naming of **C. J. Hendry Company** in California as marine sales agents. This news has just been confirmed by Mr. Wallingford as we go to press.

Born and schooled in Colorado, Norman Wallingford has followed the packing and industrial supply business both in the Rocky Mountain area and on the Coast.

●

The S.S. Don Jose, inaugurating the first regular transpacific service operated under the flag of the Philippines in history, officially docked at San Francisco, North side Pier 45, Tuesday night, August 23.

Charles A. Perkes, manager of C. F. Sharp & Company, Inc., managing operators of the Madrigal Line, is shown greeting Capt. C. Arana.

●

Perhaps you've treasured a mind's eye picture of Hawaii . . . but no matter how alluring, her subtle blend of restful ease and gay activity will outdo your fondest conceptions. Frequent sailings.

Fares: *(each way) California to Honolulu*
FIRST CLASS *from* $125 • CABIN CLASS *from* $85

Hotel reservations at Royal Hawaiian or Moana at Waikiki are made at the same time as steamer bookings.

MATSON SOUTH PACIFIC CRUISES every 4 weeks to New Zealand and Australia. *Personally-escorted.* 48 days. All-inclusive cost, complete cruise, First Class, *from* $775.

Shippers: The *Lurline* and *Matsonia* provide swift freight service to Hawaii. The *Mariposa* and *Monterey* continue to New Zealand and Australia via Samoa and Fiji. All four ships have modern refrigeration facilities. Also frequent freighter service from Pacific Coast ports.

Details from Travel Agents or:

Matson Line—Oceanic Line

San Francisco Los Angeles Seattle San Diego Portland

S.S. LURLINE • S.S. MARIPOSA • S.S. MONTEREY • S.S. MATSONIA

ON THE LARGEST OCEAN LINER, the smallest pleasure craft, you can rely on Fultec Marine Finishes for every maintenance need. Into these technical finishes go all the scientific knowledge of specialized paint chemists, and the latest, highest-quality synthetic pigments, gums and resins. And they're backed by the largest paint manufacturers in the west—with 88 years of experience. Give us your problems and we will gladly help you.

FULLER *they last* PAINTS

See the Americas First and trade with

S. S. BRAZIL, S. S. URUGUAY, S. S. ARGENTINA
offer a new fortnightly express cargo service between New York and the east coast of

SOUTH AMERICA

Rio de Janeiro, 12 days. Santos, 14 days. Montevideo, 17 days. Buenos Aires, 18 days.

Expert handling and latest equipment assure prompt, efficient transportation of perishable and semi-perishable freight.

FORTNIGHTLY SAILINGS
S. S. Argentina November 5†
S. S. Brazil November 19
S. S. Uruguay December 3
†Inaugural Sailing

Additional fast cargo vessels of the American Republics Line serve all Atlantic ports of the United States and the main outports of eastern South America.

For rates and additional information write:

AMERICAN REPUBLICS LINE
The Good Neighbor Fleet

AMERICAN REPUBLICS LINE
MOORE-McCORMACK LINES, INC.
Managing Agents, 5 Broadway, New York

Vacation of a Lifetime
WEST INDIES — SOUTH AMERICA

Here's freedom to be yourself! Leisurely cruising from port to port in southern waters! No formality . . . just solid comfort aboard McCormick's steady cargo vessels . . . with plenty of good food . . . fine outside staterooms. Enjoy the continuous panorama of colorful foreign harbors all the way to Buenos Aires and return for only **$475**
(From California Ports)

Write for descriptive folders to

McCORMICK STEAMSHIP COMPANY
Dept. P, 461 Market St., San Francisco
DOuglas 2561

Names & News

CAPT. FRED WARNER

After a fifty-year career on the Pacific, from the days of the windjammers to the era of steam propulsion ships, Capt. Fred Warner has retired from his post of chief port pilot at San Pedro due to reaching the statutory retirement age of 70.

Capt. Warner made his first sea voyages in Liverpool and Aberdeen square-riggers, then changed to California ships. He became an expert Inland Passage-Alaska pilot during the Alaska gold rush days, later becoming an officer on the transpacific ships of the old Pacific Mail Line. He became a pilot at San Pedro in 1923.

Capt. John Oliegreen is temporarily succeeding him as port pilot.

CAPT. J. W. HENDERSON

With the retirement of Capt. J. W. Henderson, captain of the British tanker Toorak—a regular caller on the Coast in the California Orient fleet of Socony-Vacuum Oil Company, Pacific Coast shipping lost one of its most colorful figures.

The captain had been a commander for Socony since 1907. He gained a wide reputation as a "U-boat dodger" during the World War, from 1914 through 1918 carrying twenty-two cargoes of fuel oil from Texas and East Indies ports to the British Grand Fleet bases at Scapa Flow and Gromarty, passing through German submarine and mine blockades without catastrophe. During this war period he commanded the tankers Massasoit and Tamaha, of the Socony fleet.

It is interesting to note that Capt. Henderson's father was master of the famous British tea clipper Thermopylae. The present captain terminated a forty-six year career in sail and steam without shipwreck or collision when he turned over his command at San Pedro to **Capt. F. A. East,** lately of the Socony motor tanker Yarravile. He has returned to his home in Aberdeen, Scotland, where he will spend the days of his retirement.

KIRKWOOD H. DONAVIN

Leaving Los Angeles the last of September, Kirkwood H. Donavin has assumed the post of South American operating manager for the new New York-Plate express service of the American Republics Line at Buenos Aires. The service will be maintained by the former Panama-Pacific liners California, Virginia and Pennsylvania, now the Argentine, Brazil and Uruguay.

Mr. Donavin is very well fitted for the new post, as he was Pacific Coast operating manager of the Panama-Pacific Line from 1923 until his resignation in 1936.

CAPT. THOMAS J. SULLIVAN

After many years as assistant inspector in the San Pedro offices of the Bureau of Marine Inspection and Navigation of the Department of Commerce, Capt. Thomas J. Sullivan has been appointed local inspector of hulls at that port, it was announced by **Capt. William Fisher,** supervising inspector of the First District. He succeeds the late Capt. Joseph Meany, who passed away in Long Beach during September.

CAPT. AUSTIN W. LANG

In Portland, Oregon, during the early part of October, Captain Austin W. Lang, Pacific Coast pilot for Isthmian Steamship Lines, passed away at the age of 50 years. He was coast pilot for nine years, prior to that being a master on the company's vessels. From 1918 to 1922 he was a lieutenant-commander in the Navy.

SEATTLE COAST GUARD PERSONNEL CHANGES

The decision of the Maritime Commission to convert the cutter Northland into a merchant marine training ship has brought about a number of changes in the Seattle district of the Coast Guard. These changes are:

Comdr. F. A. Zeusler of the Northland has been transferred to the cutter John C. Spencer, succeeding Comdr. **Edward H. Smith,** appointed commander of the cutter Chelan, stationed at Boston.

Lieut. Comdr. S. P. Mehlman, executive officer of the cutter Haida, has been transferred to Coast Guard headquarters in Washington, D. C.

Lieut. Comdr. R. C. Sarratt of the Northland will take that vessel to San Francisco for delivery to the Maritime Commission.

CARL J. NORDSTROM

After his recent nomination for the position, Carl J. Nordstrom was elected president of the Propeller Club of the United States, Port of Seattle, on September 26. He is a consulting naval architect in the Northern city, and his first job was the work of laying out of alterations to the monitor Wyoming and the cruiser New York of Spanish-American War fame.

COMMANDER F. H. HARDY

After four years of service in the United States Coast and Geodetic Survey ship Guide off the California Coast Commander F. H. Hardy has begun his duties of inspector in charge of the Seattle field station of the service, succeeding Lieut. Robert W. Knox. The latter will join one of the survey fleet ships.

Commander Hardy formerly filled his present position, but was transferred to California and appointed commander of the Guide in 1934.

S. DUVALL SCHELL

Succeeding **Joseph R. Sheehan,** who resigned to become president of Dollar Line, S. Duvall Schell has been appointed by the United States Maritime Commission as acting director. Mr. Schell was one of the assistants to the commissioners before his appointment.

HARRY T. KELLY

Announcement has come from Hammond Shipping Company, Ltd., of the appointment of Harry T. Kelly, former operating manager of Pacific Steamship Lines, to fill the same post with them, in accordance with a general expansion program of the company.

THOMAS G. REARDON

The newly established Brodin Line has appointed Thomas G. Reardon as manager in Los Angeles, according to recent announcement by Nicholas Gravem, vice president of Hind, Rolph and Company, Pacific Coast agents.

TOUMEY ELECTRIC & ENGINEERING CO.

Representing
BENDIX MARINE PRODUCTS CO.
Successors to
CHAS. CORY CORPORATION
Signaling, Communicating and Lighting Equipment
PNEUMERCATOR CORPORATION (New York)
Gauges: Liquid Level, Ships Draft, Pressure,
Boiler Water Level
PLANT MILLS DIRECTION INDICATOR
AND ENGINEER'S ALARM

MARINE AND INDUSTRIAL ELECTRIC INSTALLATIONS . . . MARINE ELECTRIC FIXTURES . . . SUPPLIES AND REPAIRS . . . ARMATURE WINDING . . . . SEARCHLIGHT PROJECTORS . . . . SOUND POWERED TELEPHONES . . . FIRE ALARM SYSTEMS

GArfield 8102 SAN FRANCISCO 115-117 Steuart St.

AMERICAN PRESIDENT LINES

Successors to Dollar Steamship Lines Inc., Ltd.

Announces

REGULAR — FREQUENT — DEPENDABLE

Sailing Schedules

. . . FOR . . .

ROUND-THE-WORLD AND TRANSPACIFIC SERVICES

EXPRESS FREIGHT — PASSENGER — REFRIGERATOR VESSELS

American President Lines
Robt. Dollar Building
San Francisco

NEW YORK
BOSTON
CHICAGO

DETROIT
WASHINGTON, D. C.
LOS ANGELES

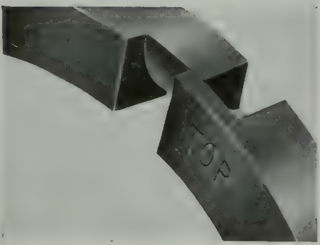
OFFICES AND AGENCIES THROUGHOUT THE WORLD

259 Vessels today

have eliminated mechanical boiler cleaning expense because their owners realize the value of the HALL SYSTEM OF BOILER WATER CONDITIONING.

The Hall Laboratories has earned the confidence and respect of every shipowner it is serving.

HAGAN CORPORATION
BOWMAN BLDG. PITTSBURGH, PA.
1000 - 16th Street - - - - - - San Francisco
1925 East Olympic Blvd. - - - - Los Angeles



Pedrick "Seal Cut" Piston Ring.

A Piston Ring That Stops All Leakage at Cut

The "Seal Cut" design of Pedrick piston ring provides for a positive and permanent seal at the cut or gap of the ring. A perfectly matched lap prevents any leakage past the ring at the cut, either down the cylinder bore or around the ring groove.

Wear of the cylinder walls does not affect this seal, because the cut is lapped far enough to take up all the opening which wear may cause.

The design and construction of the cut makes for extra strength. There are no thin cross-sections, no fragile tip to break.

"Seal Cut" rings are made in all sizes for air compressors, pumps, gas engines and oil engines. According to the maker, they seal the cylinder bore, seal the ring groove, hold high compression, permit no "blow-by," make starting easier and stop dilution and contamination.

Like all Pedrick piston rings, the "Seal Cut" design is Heat-Shaped, a patented process which insures "roundness" or equal distribution of radial pressure throughout the circumference of the piston-ring. This process also provides a black iron-oxide coating on these rings.

In addition to this iron-oxide coating the "Seal Cut" piston ring can be had with the special Pedrick "Silcoat" finish, which gives quicker seating and eliminates any possibility of scuffing of the cylinder walls during the wearing-in period. This is the period during which exhaustive tests show that most wear of rings and cylinder walls occurs. The slightest irregularity of the cylinder bore during this period causes "blow-by" of compression, which leaves a rough surface on rings and cylinder walls. The "Silcoat" finish takes care of this.

Pedrick piston rings are made by Wilkening Manufacturing Co., Philadelphia, Pa., and in Canada by Wilkening Mfg. Co. (Canada), Ltd., of Toronto.

Atlas Distributes Buda

The Atlas Imperial Diesel Engine Company of Oakland, California, and the Buda Company of Harvey, Illinois, have just concluded an agreement under the terms of which the Atlas Company becomes distributor for Buda marine engines on the entire Pacific Coast and at the Atlas factory branch at Houston, according to an announcement by F. H. Kilberry, president of the Atlas Company.

"The Atlas Company," says Mr. Kilberry, "has long been a recognized leader in the design and distribution of slow-speed, heavy-duty diesels which are noted for their dependability and economy in fishing boats, tugs, tankers and various other types of workboats. We have long recognized a substantial market in the pleasure craft field and in smaller workboats which were outside the pale of our regular line of engines.

"The Buda line of marine engines serves to round out our own service to the marine industry and permits us to meet the power requirements of the smaller, lighter, and shallow draft vessels, and other types of craft in intermittent service. Since the Buda Company has attained wide distribution in the automotive, portable and stationary fields, the advantages accruing from mass production economies in the manufacture of the majority of parts which are interchangeable in the various types is naturally reflected in higher quality and lower prices to the purchaser.

"The Buda engines are more compact and operate at higher speeds than the Atlas engines," according to Mr. Kilberry, "and we believe that our experience in the marine field and unequalled service facilities will prove a decided benefit to present Buda owners and prospective purchasers, who can now cruise the entire Pacific Coast, from Southern California to Alaska, knowing that their service requirements will be adequately taken care of by one organization, with no division of responsibilities."

Prevents Weld Spatter Adhering To Metals

A new material (Glyptal No. 1294) has been announced by General Electric for the prevention of the adhesion of weld spatter to metals which are to be welded. This material, which can be used without harm on any metal surface, including polished stainless steel, will not produce carbon to make the weld hard or brittle, nor will it reduce ductility. Likewise, it will not give off smoke to fog up the atmosphere and it will not form gas pockets or cause the weld to be porous.

In applying the new Glyptal preparation, spraying is preferred to brushing because the former method assures a thinner coat. A thin coating will protect the work as well as a thick coating—if the surface is completely covered—is more economical, and dries faster. On surfaces which are to be painted this material further serves as an excellent priming coat. In addition, it prevents the forming of rust on steel in storage yards. This is particularly important if the steel is to be subsequently welded.

The preparation will withstand temperatures up to 600 C for one-half hour, after which it will begin to evaporate.

Federal

***Marine Paints*—**

"With the quality of Endurance!"

The Federal Protected Fleet includes every type of vessel—in every class of service.

Federal painted—Federal coated ships ply in trades which bring them literally into all climates—all ports of the world.

Federal Composition and Paints are manufactured exclusively for marine needs. There's a Federal Paint for Every Marine Purpose and one good coating of Federal is TRUE ECONOMY.

The Federal Composition & Paint Company, Inc.

33 Rector Street, New York, N. Y.

ON THE PACIFIC COAST:

SEATTLE, WASHINGTON
A. T. B. Shiels
108 West Lee Street

PORTLAND OREGON
Chalmers Shipping Co.
Board of Trade Building

SAN FRANCISCO, CALIF.
Pillsbury & Curtis
100 Bush St. KEarny 3302-3

SAN PEDRO, CALIF.
Robert S. Gardner
P. O. Box 231

Agents and Stocks in all the Principal Ports

FEDERAL

℞:

Liberal quantities of Federated XXXX Nickel Babbitt ... to be taken internally ... for rehabilitation of bearings!

★ FEDERATED ★
METALS DIVISION
American Smelting and Refining Company

SAN FRANCISCO, U.S.A.
LOS ANGELES • PORTLAND • SEATTLE

Building in American Yards

Pacific Coast

BETHLEHEM SHIPBUILDING CORPORATION, LTD.
(Union Plant)
San Francisco

DRYDOCK AND ROUTINE REPAIRS: **Peter Lassen, Associated, Hoyanger, Richmond, M.S. Elg, Knud Rasmussen, American Fisher, American Oriole, M.S. Brajara, Cuzco, Losmar, Vitus Bering, State Dredger No. 4, Haviside Barge No. 4, Tug H. T. Haviside, Makaweli.**

CAMPBELL MACHINE COMPANY
Foot of 8th Avenue
San Diego, Calif.

NEW CONSTRUCTION: American **Beauty, 142-foot brine tuna clipper** powered with 6 cyl. 600 H.P. Union diesel engine, for Van Camp Sea Food Co. **Delivered October 5, 1938.**

DRYDOCK AND ROUTINE REPAIRS: **Normandie, Atlantic, Sao Joas, Azoreana, California, Cabrillo, Golden Gate, Lusitania, Navigator, Rose Marie, Ranger, Santo Amaro, Sea Boy, Yvonne Louise.**

FELLOWS & STEWART, INC.
Wilmington, Calif.

NEW CONSTRUCTION:

Contract No. 672, 75 foot overall Class "N" sloop. Completion date about October 15, 1938.

Contract No. 673, 41 foot cutter. Delivered October 1, 1938.

GENERAL ENGINEERING & DRY DOCK CO.
Foot of Fifth Avenue
Oakland, Calif.

DRYDOCK AND ROUTINE REPAIRS: **U. S. Tug Slocum, Cutter Shoshone, Barge Dolphin II, Gas. S. Sea Giant, Gas. S. California Star, Gas. S. St. Mary, Tug Contocook, Dredge Seattle, Esther Johnson, Lumbertown, Tug Standard No. 1, Tug Despatch No. 6, Stanwood, Elna, Makawao.**

HARBOR BOAT BUILDING CO.
Berth 264, Fish Harbor
Terminal Island, Calif.

DRYDOCK AND ROUTINE REPAIRS: **Destiny, Sea Tern, Northwestern.**

HONOLULU IRON WORKS
Honolulu, T. H.

DRYDOCK AND ROUTINE REPAIRS: **Makua, Mahimahi, Manukai, Forthbank, Constance Chandler.**

LAKE WASHINGTON SHIPYARDS
Houghton, Wash.

DRYDOCK AND ROUTINE REPAIRS: **Kinai, M.S. Patterson, Lighthouse Tender Rose, Pioneer.**

LOS ANGELES SHIPBUILDING & DRY DOCK CORP.
Los Angeles Harbor
San Pedro, Calif.

DRYDOCK AND ROUTINE REPAIRS: **Montebello, Yacht Enchantress, Tejon, W. S. Rheem.**

MARE ISLAND NAVY YARD
Mare Island, Calif.

NEW CONSTRUCTION:

Swordfish, Submarine (SS193); keel laid October 27, 1937; estimated delivery date August 1, 1939.

Two harbor tugs, YT 133 and YT 134; keels laid September 29, 1938.

Garbage Lighter (YG 21); keel laid July 25, 1938.

Order received for construction of one submarine tender, Fulton (AS 11); dated June 30, 1938.

Order received for construction of one submarine, Tuna (SS 203); dated June 30, 1938.

DRYDOCK AND ROUTINE REPAIRS: **Memphis, Chicago, Langley, Drayton, Flusser, Lamson, Mahan, Porter, Balch, Reid, Cummings, Hull, Dewey, Phelps, Worden, MacDonough, Oriole, Turkey, Grebe, Teal, Melville, Pinola, Arctic, Sirius, Tarpon, Perch, Porpoise, Shark.**

THE MOORE DRY DOCK CO.
Oakland, Calif.

NEW CONCTRUCTION: **Hulls Nos. 193 and 194, two lighthouse tenders** for Bureau of Lighthouses; LOA 174' 10½", beam molded 32', depth 14' 6". Twin screw triple expansion engines; water tube boiler; 1000 horsepower. One for Pacific Coast; one for Great Lakes.

DRYDOCK AND ROUTINE REPAIRS: **J. A. Moffett, Mauna Loa, Isthmian, Komoku, New Deal, Carolinian, W. B. Walker, Puerto Rican, Charcas, Silvermaple, Tacoma, Edgar Luckenbach, Brunswick, Adamina, Katharine Sudden, American Oriole, Djambi, Leslie J. Fulton, Manoeran, Associates, Portland, Bahrein, Saporea, Santa Rosalia, Elg, San Rafael, Excellent, S. C. T. Dodd, Washingtonian, Floridian, Daldorch, Atheltemplar, Jane Christenson, Dakotan, Georgian, Ketchikan, Tug E. P. Ripley.**

THE PUGET SOUND NAVY YARD
Bremerton, Washington

NEW CONSTRUCTION:

U.S.S. Wilson (Destroyer No. 408); standard displacement, 1500 tons; keel laid March 22, 1937.

U.S.S. Charles F. Hughes (Destroyer No. 428); standard displacement 1600 tons; order placed by Navy Department December 7, 1937.

Ships authorized but work not started: 2 harbor tugs Nos. 138 and 139; 2 seaplane tenders AVP10 and AVP11; 1 destroyer DD436, Monssen.

DRYDOCK AND ROUTINE REPAIRS: **California, Louisville, Patterson, Jarvis, Lexington, Pennsylvania, Spencer.**

TODD SEATTLE DRY DOCKS, INC.
Harbor Island
Seattle, Wash.

DRYDOCK AND ROUTINE REPAIRS: **Edgar Luckenbach, Condor, Lena Luckenbach, Edward Luckenbach, Massamar, M.S. Northland.**

WESTERN BOAT BUILDING CO., INC.
2505 East 11th Street
Tacoma, Wash.

NEW CONSTRUCTION:

Hull No. 131, purse seine fishing boat, 78'x20'x9'; 200 H.P. Atlas engine; launching date May 1, 1938.

Hull No. 132, 50' pick-up fishing boat for New England Fish Company. Keel laid March 12, 1938.

Atlantic, Lakes, Rivers

ALABAMA DRY DOCK AND SHIPBUILDING CO.
Mobile, Ala.

NEW CONSTRUCTION: **Two all welded steel barges** 225' x 35 x 10' 3" for Standard Oil Co. of Kentucky. **Delivered.**

Two all welded steel barges 128' x 32' x 7' 10".

DRYDOCK AND ROUTINE REPAIRS: **Malacca, Banan, Hagan, Pan Royal, Swift-**

903 FIFE BLDG.
1 DRUMM ST.

THOMAS A. SHORT

Successor to

C. V. LANE

Marine Representative:
Thos. A. Short,
1 Drumm Street, San Francisco

HYDE STEERING GEARS
HYDE WINCHES
HYDE WINDLASSES
HYDE CAPSTANS
HYDE MANGANESE BRONZE PROPELLERS & CASTINGS
A. B. SANDS & SON CO., PLUMBING FIXTURES
SMOLENSKY NOISELESS CHECK VALVES
CATERPILLAR TRACTOR CO. MARINE POWER PLANTS AND AUXILIARY SETS
BACHARACH INDUSTRIAL INSTRUMENT COMPANY
DIEHL MFG. CO. FANS, MOTORS, GENERATORS
SUBMARINE SIGNAL COMPANY FATHOMETER
SHENANGO-PENN MOLD CENTRIFUGALLY CAST LINERS
WELIN QUADRANT AND SHEATH SCREW DAVITS
WELIN-MACLACHLAN GRAVITY DAVITS
WELIN LIFEBOAT WINCHES
WELIN METALLIC LIFEBOATS AND LIFERAFTS
SHORT OIL SEPARATOR
WILLIAM W. NUGENT & CO., OIL FILTERS
U. S. METALLIC PACKING
CONSOL RUST REMOVER
CONSOL RED and BLACK

B. F. GOODRICH CUTLESS RUBBER BEARINGS
MEEHANITE CASTINGS—PISTON RING STOCK, BURNER CONES, ETC.
SHORT OIL DETECTING SERVICE FOR PROTECTING BOILER FEED WATER AND FUEL OIL HEATERS

Hyde Windlass Company

Steering Gears, Windlasses, Capstans, Bronze Propellers
—as installed on America's finest ships.

Bath, Maine

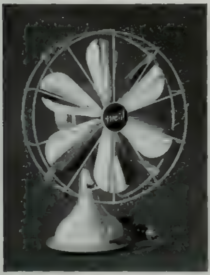
Pacific Coast Representative:
Thos. A. Short, 1 Drumm Street, San Francisco

Inter-Coastal Paint Corporation

SAN LEANDRO, CALIFORNIA

Originators and sole manufacturers of CONSOL both plain and in colors. A conditioning solution for metal surfaces that have become corroded. Not only a scale remover but a preservative as well. Gives excellent results when applied to boottop belt, hull, holds, bilges, tank tops, chain lockers, ventilator trunks, decks and so forth. Is non-inflammable and contains no acids or chemicals that are injurious to men or metal.

Marine Representative
Thos. A. Short, 1 Drumm Street, San Francisco

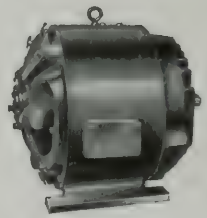


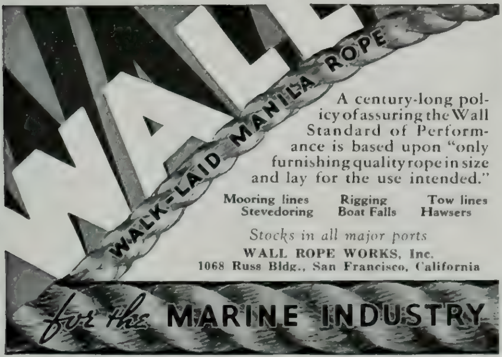
Marine Motors, Generators and Ventilating Equipment

DIEHL MANUFACTURING COMPANY

Electrical Division of
THE SINGER MANUACTURING CO.
Elizabethport, New Jersey

San Francisco Representatives:
MARINE ELECTRIC CO. Desk and Wall Fans
THOMAS A. SHORT Motors, Generators, etc.





A century-long policy of assuring the Wall Standard of Performance is based upon "only furnishing quality rope in size and lay for the use intended."

Mooring lines Stevedoring Rigging Boat Falls Tow lines Hawsers

Stocks in all major ports
WALL ROPE WORKS, Inc.
1068 Russ Bldg., San Francisco, California

Oakland Municipal Terminals

— Superior and Dependable Service —

Outer Harbor Terminal
Grove Street Terminal
Ninth Avenue Terminal
Livingston Street Pier
Dennison Street Pier

Oakland Municipal Airport

For additional information, write

PORT OF OAKLAND
Grove Street Terminal - Oakland, California

scout, Coppename, Wacosta, M.S. Molda, Steamboat Missouri, Dredge Mobile, Tug Hulver, A. T. & N. Car Ferry No. 1.

BATH IRON WORKS

Bath, Maine

NEW CONSTRUCTION: **Hulls Nos. 162 and 163; DD395 Davis and DD396 Jouett; two 1850-ton destroyers for U.S. Navy;** date of contract September 19, 1935. Keels laid, No. 162, July 28, 1936; No. 163, March 26, 1936. Launching dates, No. 162 July 30, 1938; No. 163 September 24, 1938; **estimated delivery dates October** and December, **1938,** respectively.

Hulls Nos. 170-171, DD409, Sims, and DD410, Hughes, two 1500-ton destroyers for U. S. Navy; contract date October 12, 1936; keels laid July 15 and September 15, 1937, respectively; launching dates, indefinite; delivery dates April, 1939, and June, 1939, respectively.

Hulls Nos. 177 and 178, DD423 and DD424, two 1620-ton destroyers for U. S. Navy. Contract date September 30, 1937; delivery dates April and June, 1940, respectively.

BETHLEHEM SHIPBUILDING CORPORATION, LTD.

Fore River Plant,
Quincy, Mass.

NEW CONSTRUCTION:

CV7, Wasp, Airplane Carrier for U. S. Government; keel laid April 1, 1936; estimated launching date December, 1938.

Hulls Nos. 1467, 1468, 1469, three passenger and freight steamers for Panama Railroad S.S. Co.: 486 feet x 64 feet x 38 feet 6 inches; 16½ knot speed. Keels laid, Nos. 1467 and 1468, October 25, 1937; No. 1469, November 15, 1937; **estimated launching dates** September 24, 1938, **November, 1938,** and January, 1939.

Hulls Nos. 1470 and 1471, two 1500-ton destroyers for U. S. Government; delivery dates March, 1940, and May, 1940.

Hulls Nos. 1472 and 1473, two diesel powered trawlers 147′0″ overall, 128′9″ perps., 27′0″ beam, 14′4″ depth, **Hull No. 1472 launched October 8, 1938; estimated delivery dates November 15** and December **15, 1938.**

Hulls Nos. 1474, 1475, 1476 and 1477, four freight vessels for American Export Lines Inc.: 450′ B.P. x 66′ x 42′3″; 16½ knots; geared turbines and water tube boilers.

BETHLEHEM SHIPBUILDING CORPORATION, LTD.

Sparrows Point Plant
Sparrows Point, Md.

NEW CONSTRUCTION:

One tanker for Texas Co.; about 13,000 deadweight tons; steam turbine; launched September 1, 1938.

Hull No. 4334; one 13,000 dwt. oil tanker for Union Oil Co. of Calif. Contract signed March, 1938.

Hulls Nos. 4329, 4330, 4331; three 16,300 dwt. ton tankers for Standard Oil Co. of N. J.; 18 knots speed. Contract signed January 3, 1938.

Hulls Nos. 4332 and 4333; two 16,000 dwt. tankers for Socony Vacuum Oil Co. Contract signed February, 1938.

BETHLEHEM SHIPBUILDING CORPORATION, LTD.

Staten Island Works
Staten Island, N. Y.

NEW CONSTRUCTION:

Hull No. 856, fireboat for City of New York. Length O.A. 134′0″, breadth 32′0″, depth 13′3″. Keel laid April 19, 1938; launched August 26, 1938; **estimated delivery date October 15, 1938.**

Hulls Nos. 8001, 8002, and 8003, three U. S. Navy fleet tugs. No. 8001, keel laying date January 24, 1939; launching date July 11, 1939; delivery date January 25, 1940. No. 8002, keel laying date February 7, 1939; launching date September 5, 1939; delivery date March 25, 1940. No. 8003, keel laying date February 21, 1939; launching date November 7, 1939; delivery date May 25, 1940.

BOSTON NAVY YARD

Boston, Mass.

NEW CONSTRUCTION:

DD402, Mayrant, and DD403, Trippe, two light destroyers for United States Navy; LBP 334′, beam 35′6″, depth 19′8″; keels laid April 15, 1937; launched May 14, 1938; estimated delivery dates October, 1939, and November, 1939, respectively.

DD415, O'Brien, and DD416, Walke, two destroyers; LBP 341′, beam 36′, depth 19′8″ keels laid May 31, 1938; launching date November, 1939; delivery dates May, 1940, and July, 1940.

DD425, Madison, and DD426, Lansdale, two destroyers; 341′0″ x 36′0″ x 19′8″. Keel laying date December 1, 1938; launching date November 1, 1939; delivery date 1940.

DD433 and DD434, two destroyers, contract awarded July 23, 1938. Completion date 1941.

BROOKLYN NAVY YARD

Brooklyn, N. Y.

NEW CONSTRUCTION:

CL 50, **Helena, light cruiser;** L.B.P. 600′, beam 61′7¾″, standard displacement 10,000; geared turbine engines; express type boilers; keel laid December 9, 1936; launched August 27, 1938; estimated delivery January 2, 1940.

BB 55, **North Carolina, battleship;** L.BP 714′ 0″, beam to outside armor 108′ 0″, std. displ. 35,000 tons; geared turbine engines; express type boilers. Keel laid October 27, 1937; estimated launching date May 1, 1940; contract delivery September 1, 1941; estimated delivery date October 15, 1941.

CHARLESTON, S. C., NAVY YARD

Charleston, S. C.

NEW CONSTRUCTION:

Order placed for **one harbor tug;** LOA 124′ 9″, length between perpendiculars 117′, breadth molded 28′, depth molded 16′; keel laid August 2, 1937; launched March 7, 1938.

Order placed for **one harbor tug;** LOA 110′ 3″, LBP 98′ 0″, breadth 24′ 0″, depth at side amidships 13′ 6″. No dates set.

Order placed for one **harbor tug;** 65 feet long.

DEFOE BOAT & MOTOR WORKS

Bay City, Mich.

NEW CONSTRUCTION:

Hulls Nos. 72 and 73; two diesel electric harbor cutters for Coast Guard; 110′ x 26′ 6″; powered by 1000 S.H.P. General Motors engines; steel construction. Delivery date April, 1939.

THE DRAVO CORPORATION

Engineering Works Division
Pittsburgh, Pa., and Wilmington, Del.

NEW CONSTRUCTION:

Hulls Nos. 1463-1465, three welded cargo box barges 100′ x 26′ x 6′6″, for stock; 495 gross tons.

Hulls Nos. 1468-1469, 2 welded W-5 coal barges 175′ x 26′ x 10′8″, for stock; 944 gross tons.

Hulls Nos. 1480-1489, ten welded ash removal barges 150′ x 37′ x 12′9″, for Department of Sanitation, City of New York; 5530 gross tons.

Hulls Nos. 1490-1492, three welded steel coal barges 126′ x 34′ x 17′, for stock; 2019 gross tons.

Hulls Nos. 1493-1502, ten welded W-6 coal barges 175′ x 26′ x 10′8″, for stock, 4720 gross tons.

Hulls Nos. 1503-1504, two welded steel oil barges 195′ x 35′ x 9′6″, for stock; 978 gross tons.

ELECTRIC BOAT CORP.

Groton, Conn.

NEW CONSTRUCTION:

Hull No. 29, Sargo (SS188); standard displacement 1450 tons; keel laid May 12, 1937; launching date June 6, 1938; delivery date February, 1939.

Hull No. 30, Saury (SS189); standard displacement 1450 tons; keel laid June 28, 1937; launching date August 20, 1938; delivery date April, 1939.

Hull No. 31, Spearfish (SS190); standard displacement 1450 tons; keel laying date September 9, 1937, **launching date October 29, 1938;** delivery date June, 1939.

Hull No. 33, Seadragon (SS194); 1450 tons; keel laying date April 18, 1938; delivery date December, 1939.

Hull No. 34, Sealion (SS195); 1450 tons; keel laying date June 20, 1938; delivery date February, 1940.

Hull No. 35, Tambor (SS198); standard displacement 1475 tons; keel laying date January 16, 1939; delivery date January, 1941.

Hull No. 36, Tautog (SS199); standard displacement 1475 tons; keel laying date March 15, 1939; delivery date March, 1941.

Hull No. 37, Thresher (SS200); standard displacement 1475 tons; keel laying date May 15, 1939; delivery date May, 1941.

THE FEDERAL SHIPBUILDING AND DRYDOCK COMPANY

Kearny, N. J.

NEW CONSTRUCTION:

Three destroyers, DD397 Benham, DD398 Ellet and DD399 Lang, 1500 dis. tons; keels

FOR FAST, DEPENDABLE SERVICE TO *ALL* PARTS OF THE WORLD, SHIP

French Line

FAMOUS FOR 74 YEARS

Moroccan Service • Mediterranean Service • North Pacific Coast Service • West Indies, Cuba and South America Service • Mexico, Cuba, Spain Service.

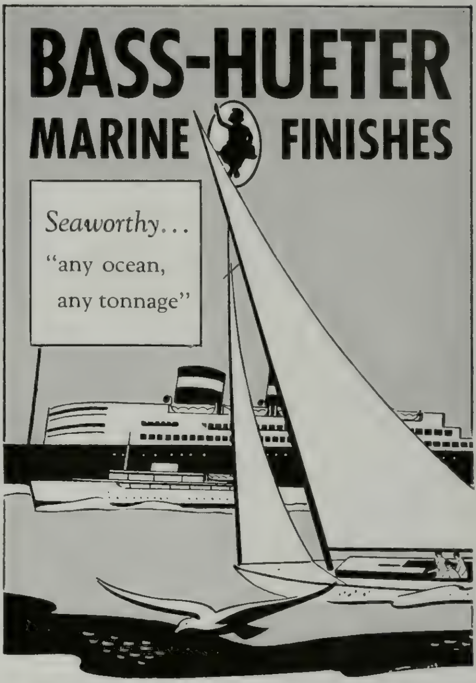
New York to England, France, and thus to all Europe:

NORMANDIE
(World's Largest Ship)
ILE DE FRANCE
PARIS
CHAMPLAIN
DE GRASSE

General Agents for Messageries Maritimes, Chargeurs Reunis and Compagnie Sud-Atlantique, Air-France.

FRENCH LINE

222 Stockton St., San Francisco, Calif.; 510 W. 6th St., Los Angeles, Cal.; 307 White Bldg., Seattle, Wash.; 966 Hastings Street W., Vancouver, B. C., 19 State St., New York.



ASK THE NATIONAL LEAD MAN!

VIKING . . . .

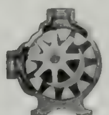
OFFERS THE MOST COMPLETE LINE OF ROTARY PUMPS IN THE WORLD!

Take time out right now and send in your request for Bulletin 2100-35. It gives you all the facts and figures on Viking's complete line of rotary pumps—with models ranging from fire and bilge pumps to extra capacity Marine Terminal and Tanker Units.

Remember, if it's a job for a rotary pump, you'll find the pump at Viking.

Pacific Coast Distributors:
VIKING PUMP COMPANY
2038 S. Santa Fe Avenue
Los Angeles, Calif.
DE LAVAL PACIFIC CO.
61 Beale St.
San Francisco, Calif.

The famous Viking principle consists of only 2 moving parts — your guarantee of lasting performance free from expensive repairs.



VIKING PUMP COMPANY
CEDAR FALLS, IOWA

FRANCE

TRADE MARK

Manufactured exclusively by

FRANCE PACKING COMPANY
Main Office and Factory
TACONY, PHILADELPHIA

Sole Authorized Representatives:

SAN FRANCISCO—HERCULES EQUIPMENT & RUBBER CO.
550 - 3rd Street—EXbrook 2575

SEATTLE—GUY M. THOMPSON
1241 South Alaskan Way—Phone MAin 1870

PORTLAND—E. B. HUSTON
127 S. W. First Ave.—Phone ATwater 6754

LOS ANGELES—A. C. ELDER
2714 South Hill St.—PRospect 9529

NEW YORK CITY—FRANCE PACKING COMPANY
Room 107-E, 30 Church St.—Cortlandt 7-6827

laid September 1, 1936, December 3, 1936, and April 5, 1937, respectively; launching dates April 16, June 11 and August 27, 1938, respectively.

Two destroyers, DD411 Anderson and DD412 Hammann; keels laid November 15, 1937, and January 17, 1938, respectively.

Hulls Nos. 151, 152 and 153, three tankers for Standard Oil Co. of New Jersey; keels laid, No. 151, July 1, 1938; No. 152, July 15, 1938.

Hulls Nos. 154-159, six C-2 cargo vessels for U. S. Maritime Commission. Keels laid, No. 154, August 25, 1938; No. 155, September 20, 1938.

Hulls Nos. 160 and 161, two torpedo boat destroyers for the United States Navy.

INGALLS IRON WORKS CO.

Birmingham, Ala.

NEW CONSTRUCTION:

One 15-ton derrick boat hull for U.S. E.D.; launched June 1, 1938.

Two diesel dredge tenders 63' x 15'6" x 6'3" for U. S. Engineer Office, Memphis, Tenn. Launching date about September 10, 1938.

Ten hopper type cargo barges 280' x 48' x 11' for Inland Waterways Corp. **Launching dates June to October, 1938.**

JAKOBSON & PETERSON, INC.

Brooklyn, N. Y.

NEW CONSTRUCTION:

Hull No. 276, 86-foot all welded steel tug. Launching date August 31, 1938; **delivery date October 1, 1938.**

LEVINGSTON SHIPBUILDING CO.

Orange, Texas

NEW CONSTRUCTION:

Three all welded cargo barges 140' x 30' 2½" x 9'; **delivery date November, 1938.**

One all welded tugboat 80' LOA, 19' 7" beam overall, 9' depth molded; powered with 380 H.P. Atlas diesel; **delivery date November, 1938.**

One all welded passenger ferry 132' LOA, 40' 8½" beam overall, 10' depth. Equipped with two 200 H.P. Atlas diesel engines. Delivery date December, 1938.

THE MARYLAND DRYDOCK CO.

A Subsidiary of Koppers Company, Baltimore, Maryland

NEW CONSTRUCTION:

Hull No. 194, single screw steel derrick lighter for U. S. Engineer Office, N. Y. District. LOA 115' 9⅜" LBP 110', beam overall 30' 8¾", beam molded 30', depth molded 11' 9", frame spacing throughout 21", load displacement 438 tons, mean load draft molded 9' 2½". Keel laying date October, 1938; estimated launching date December, 1938.

DRYDOCK AND ROUTINE REPAIRS:

Lightship No. 84, St. Johns.

THE NEW YORK SHIPBUILDING CORPORATION

Camden, N. J.

NEW CONSTRUCTION:

Hull No. 416, Phoenix (CL46), light cruiser; 10,000 tons, for U. S. Navy Department; keel laid 1937; launched March 12, 1938; **delivered.**

One destroyer tender for U. S. Navy; order placed December 27, 1937.

One seaplane tender for U. S. Navy; order placed December 27, 1937.

NEWPORT NEWS SHIPBUILDING & DRYDOCK CO.

90 Broad Street, New York

NEW CONSTRUCTION:

H362, light cruiser, CL49, St. Louis, keel laid December 10, 1936; launched April 15, 1938; delivery date March, 1939.

Hulls Nos. 363-364, two destroyers, Nos. 413, Mustin, and 414, Russell; keels laid December, 1937; delivery dates June and August, 1939.

Hull No. 369, twin screw mail, passenger and cargo liner for United States Lines Co.; length 723', beam 92', depth 45'. Keel laying date August 22, 1938.

Hulls Nos. 370, 371 and 372, three oil tankers for Standard Oil Company of New Jersey; gross tonnage about 11,500 tons; L.B.P. 525', breadth molded 75', depth molded 39'.

Hulls Nos. 373, 374, 375 and 376, four single screw cargo vessels for United States Maritime Commission; turbine propulsion; gross tonnage about 9000 tons; length 435', breadth 63', depth 40'6".

PORTSMOUTH, N. H., NAVY YARD

Portsmouth, N. H.

NEW CONSTRUCTION:

Six submarines, Sculpin, Squalus, Searaven, Seawolf, Triton and Trout.

THE PUSEY & JONES CORP.

Wilmington, Del.

NEW CONSTRUCTION:

Hull No. 1070, one steel hopper dredge, Chester Harding; 2,500 cubic yard capacity; length overall 308'2", length B.P. 300'0", breadth molded 56'0", depth molded 29'0". Contract date February 14, 1938; keel laid May 15, 1938; launching date December 20, 1938; delivery May, 1939.

Hull No. 1071, one steel lighthouse tender, Lilac Class, for Dept. of Commerce, Bureau of Lighthouses. Gross tonnage approximately 700 tons.

SUN SHIPBUILDING AND DRY DOCK COMPANY

Chester, Pa.

NEW CONSTRUCTION:

Hulls No. 172, 173 and 174, three tankers for Standard Oil Co. of New Jersey; steam turbine; 525" x 75' x 39'; 16,300 dwt. Keel laying dates April 18, May 31 and July 14, 1938; delivery dates February 1, April 11 and May 15, 1939.

Hulls Nos. 175-180, six single screw diesel cargo vessels, C-2 design, for U. S. Maritime Commission; equipped with Sun-Doxford engines. Delivery dates July 4, 1939; September 2, 1939; November 1, 1939; December 31, 1939; March 1, 1940, and May 1, 1940.

Hull No. 181, single screw steam turbo electric drive tanker for Atlantic Refining Co.; 521' x 70' x 40'. Delivery date March 1, 1940.

Literature of the Industry

The Port of Mobile, Ala., is a revision of a former report and is issued jointly by the Board of Engineers for Rivers and Harbors, War Department, and the United States Maritime Commission, as part 1 of Port Series No. 3.

The port of Mobile is administered by the Alabama State Docks Commission, which has completed the construction of three piers and a marginal wharf along the west bank of the Mobile River and a bulk material handling plant on Three Mile Creek. A foreign trade zone, the second in the United States, has been established by the dock commission at Pier A, south, which comprises one of the most modern facilities in the harbor. The total area of the zone, including the 7 warehouses and land area adjacent to pier A, is 15.3 acres. The port has a total of 55 piers, wharves and bulkheads, 3 coal bunkering facilities, 3 oil bunkering facilities, 1 grain elevator, ample storage warehouse facilities and bulk freight storage space, 5 drydocks and 5 marine railways, several marine repair plants equipped to make repairs to engines, hulls, and boilers of vessels, 1 of which is also equipped for shipbuilding, and there is sufficient floating equipment available to meet the needs of the port.

New Fillet Welding Electrode

Metal & Thermit Corporation announces an addition to its line of Murex heavy coated electrodes for manual arc welding. The new electrode, known as Murex Fillex, is designed for fillet welding and other downhand work. Welds made with this electrode have physical properties meeting the American Welding Society's specifications for Grade 10 Filler Metal. Outstanding feature, it is claimed, is low cost of deposited metal. Used at unusually high amperages, Fillex will not undercut and is said to permit welding operators to increase output appreciably. Descriptive literature is available.

Pacific Paint & Varnish Co.

Snythex Red Lead Primer (Q. D.)
" Anti-Corrosive
" Anti-Fouling
" White Enamel-Non-Bilge (O.S. & I.S.)
" Cabin Enamels (Q. D.)
" Mast Colors, Hull Black
" Boottopping, etc.

Synthex Marine Spar Varnishes and Yacht White Enamel

Aluminum Enamel

Flat White (Inside & Outside)

A specialized finish for each paintable surface.

Pacific Marine Finishes have been used successfully for years by most of the important steamship companies. Each represents a specially developed product for a specific purpose. Quality—not price—is the objective of our Research Department.

L. M. DuCOMMUN
President

San Francisco and Berkeley

A. B. ROBERTSON
Vice President

SWAYNE & HOYT, Ltd.

SHIPOWNERS *and* AGENTS

215 Market Street - San Francisco, California, U.S.A.

GULF PACIFIC LINE
(Between Gulf Ports and Pacific Coast)

CALMAR LINE
(Between North Atlantic and Pacific Coast)

YAMASHITA LINE
(Far East—New York—South America)

OFFICES:
Seattle - Portland - San Francisco - Oakland - Los Angeles - Chicago - St. Louis - Cincinnati - New York
New Orleans - Mobile - Birmingham - Houston

EUGENE V. WINTER CO.

•

Representing

NATIONAL TRANSIT PUMP & MACHINE CO.
Reciprocating and rotary pumps for marine, industrial and refinery service.

CONDENSER SERVICE & ENGINEERING CO., INC.
Heat Exchanger Specialists.

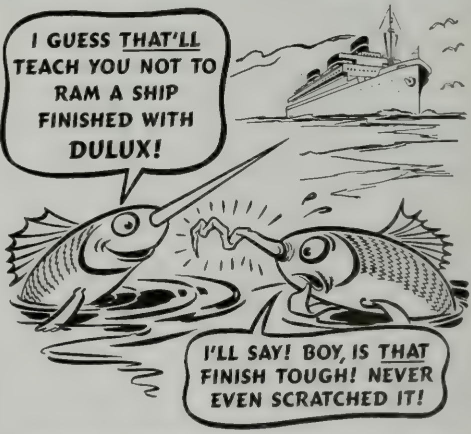
REILLY FEED WATER COILS
Carried in San Francisco stock.

THE MAXIM SILENCER COMPANY
All types of silencers and spark arresters for gasoline and diesel engines, and air compressors.

RED HAND COMPOSITIONS CO., INC.
Marine Bottom Paints.

KOPPERS CO.—AMERICAN HAMMERED PISTON RING DIVISION
Piston rings for gasoline, diesel and steam engines, air compressors. Diameters from 1 inch to 120 inches—separately cast.

EUGENE V. WINTER CO.
19 Main Street, San Francisco, Calif.
Phone: DOuglas 2714


I GUESS THAT'LL TEACH YOU NOT TO RAM A SHIP FINISHED WITH DULUX!
I'LL SAY! BOY, IS THAT FINISH TOUGH! NEVER EVEN SCRATCHED IT!

● DULUX is the toughest finish that ever put to sea. And because of its amazing durability, it is saving money on thousands of ships of every size.

DULUX keeps its fine appearance *longer* . . . in spite of the extreme exposures every marine finish must face—tropic sun, salt air, salt spray, rough seas, discoloring harbor gases.

If you'd like complete information about DULUX, just write: E. I. du Pont de Nemours & Co., Inc., 235 Second Street, San Francisco; 2419 South Grand Avenue, Los Angeles; 525 Boren Avenue, North, Seattle.

DU PONT DULUX
REG. U. S. PAT. OFF.
MARINE FINISHES

● Hunt-Spiller Coast Man

Newell B. Robbins was appointed Pacific Coast Representative of Hunt-Spiller Manufacturing Corporation, effective June 1, 1938.

From 1917 to 1931 Mr. Robbins was employed by the Superheater Company of New York in various capacities in their machine shop, inspection department, test laboratory and in their sales and service department.

He was employed by the Malleable Steel Range Company of South Bend, Indiana, from 1932 to 1933 in their machine shop and assembly plant, and from 1934 to 1938 was with the Barco Manufacturing Company of Chicago as service and sales engineer.

Amercoat on Guard Against Corrosion is the title of a booklet recently published by the American Concrete and Steel Pipe Company of South Gate, California.

Amercoat is a trade name covering a series of solutions designed to be brushed or sprayed on surfaces as a corrosion, electrolysis, erosion, and abrasion resistant coating.

Marine users will be especially interested in Amercoat Solutions Nos. 13, 14 and 15, respectively named

---

● An Onslaught

One time a kind old lady thought she would like to make friends with a certain army officer, so she decided to ask him to tea.

The invitation began — "The pleasure of Captain Johnson's company is requested at a tea, etc."

The answer ran as follows—"Privates Smythe and Johns have been detailed for guard duty, but the remainder of Captain Johnson's company accept with pleasure."

DAHL-BECK ELECTRIC CO.

● MARINE AND INDUSTRIAL INSTALLATIONS ● MOTOR AND GENERATOR REPAIRING

Representatives for

VAN BRUNT WATERTIGHT FIXTURES AND FITTINGS
A.D.T. AERO AUTOMATIC FIRE ALARM SYSTEMS
C. C. GALBRAITH & SON, INC.—Loud Speaker Systems
SPEER CARBON AND GRAPHITE BRUSHES

115 MISSION STREET - SAN FRANCISCO
Phone: EXbrook 5215

HAVISIDE COMPANY

Largest Commercial Heavy-Lifting and Salvage Barges on the Pacific Coast

Four Derrick Barges - - - Capacity up to 100 tons
Submarine Diving

SHIP CHANDLERS
Specialists: Yacht Sails and Yacht Rigging
Complete stock of Yacht and Motorboat Supplies

Agents for
Columbia Steel Co.'s Products (Subsidiary U. S. Steel Corporation)
American Marine Paint Co.
Jeffrey's Marine Glues
Tubbs Supercore and Manila Rope
Stratford's Best Oakum

HAVISIDE COMPANY
SAN FRANCISCO
56-62 Steuart Street - - - Phone EXbrook 0064

John Finn Metal Works

SPECIAL ARMATURE METAL
NICKEL DIESEL METAL FOR BEARINGS
ZINC PLATES FOR BOILERS
GALVANIZING AND SHERARDIZING

SAN FRANCISCO—384 Second Street—Phone SUtter 4188
LOS ANGELES BRANCH—554 South San Pedro Street, Los Angeles
Telephone MIchigan 0984
SEATTLE BRANCH—106 W. McGraw Street, Seattle, Wash.
Telephone SEneca 2466

. . THE . .

"Arcform" Ships at Sea

These vessels have proved themselves in actual performance the most efficient and economical ships of their class in operation today.

The Masters and Officers of the three "Arcform" cargo vessels at sea report their behaviour is consistently EXCELLENT and especially so IN BAD WEATHER.

The Steel Hatches fitted in these vessels have given the utmost satisfaction and are unquestionably an additional source of safety against foundering.

Sir Joseph W. Isherwood & Co., Ltd.

4 Lloyd's Avenue
London : E.C.3

New York : U.S.A.
17 Battery Place

Propeller Design

● Save Fuel
● Increase Speed
● Eliminate Vibration

Send us your problems . . . we specialize in propeller design.

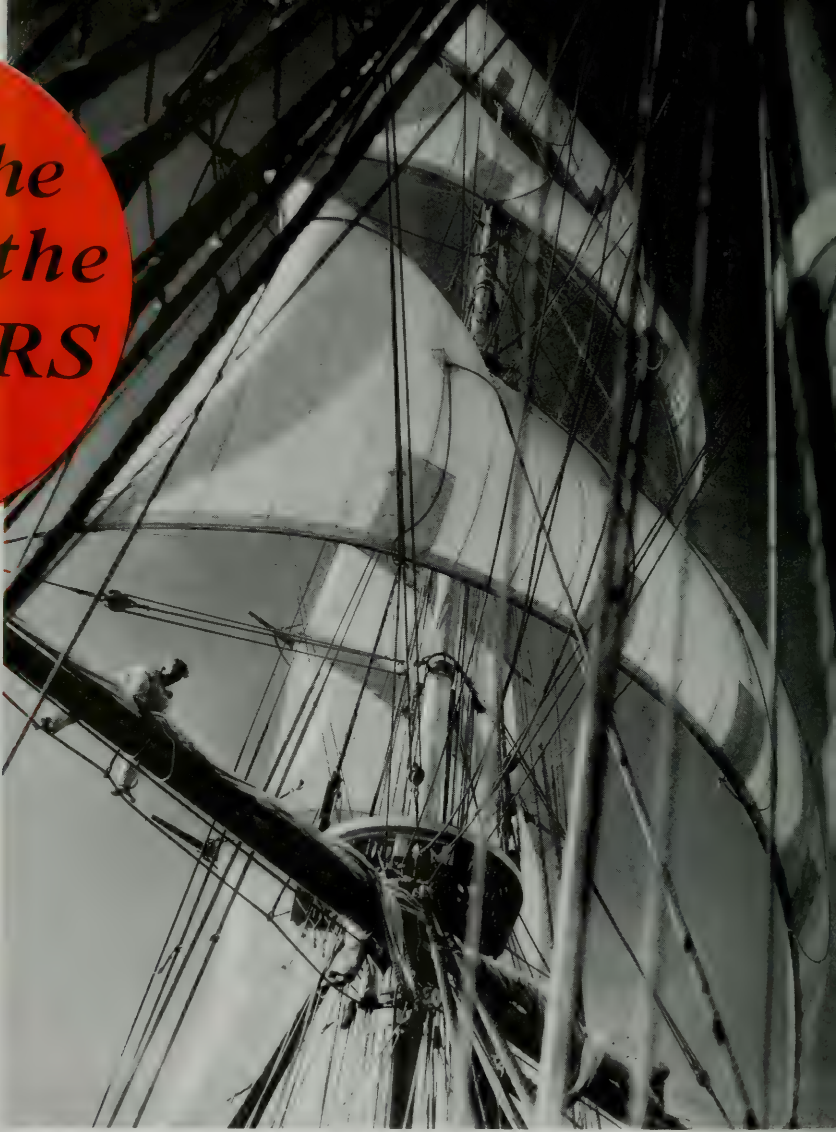
WILLIAM LAMBIE, Naval Architect
106 East C Street
Wilmington, California

LAMBIE PROPELLERS

PACIFIC MARINE REVIEW

DECEMBER, 1938

From the days of the CLIPPERS



Since 1856 . . . when the majestic clippers sailed the blue waters of the Pacific . . . the name of TUBBS has stood for dependability in Marine cordage. Just as true today as it was then, Tubbs Marine rope is recognized for its extra strength, its longer wearing qualities, its ease of handling. Be sure you specify it by trade name for every use aboard ship —

SUPERCORE - - EXTRA SUPERIOR MANILA

TUBBS ROPE

TUBBS *Cordage Company*

200 Bush Street, San Francisco
Mills in San Francisco

PACIFIC MARINE REVIEW

DECEMBER, 1938

Official Organ

Pacific American Steamship Association

Shipowners Association of the Pacific Coast

Our Frontispiece

The picture used for a frontispiece this month is a fine modern sailing ship off the heads outside the Golden Gate just after she has been "cast loose" by the tug. The photo is by Gabriel Moulin.

TABLE OF CONTENTS

Editorial Comment:

Let's Start the Rivet Guns 21

Some Famous Pacific Coast Shipbuilders 23

With the Naval Architect and Marine Engineer 24

Your Problems Answered 26
By "The Chief."

Evolution in Marine Furnaces 29

Steady As You Go! 30
For Deck Officers.

Rubber in Ship Construction 34
By Herbert Christophersen.

San Francisco in 1999 36

New York's Latest Fireboat 38

Pacific Northwest Notes 42

On the Ways:

Latest News from American Shipyards 44

Safety on Shipboard:

Lights Along the Shore 46

Building in American Yards 54

Miscellaneous: A New Bearing Industry, 28; Deck Officers' Licenses, 32; Engineers' Licenses, 33; Permanent Protection for Pipe Lines, 37; Literature of the Industry, 37; A Tanker's Inland Voyage, 40; Covic Diesel Expansion, 41; Grease Lubricators for Auxiliary Machinery, 41; A New Steam Testing Service, 47; New Hose for Engine Exhaust Pipe, 48; Something New for Shower Bath Stalls, 48.

PUBLISHED AT 500 SANSOME STREET . . . . SAN FRANCISCO

Entered as second class matter June 20, 1913, at the post office, San Francisco, under the Act of March 3, 1879. Published on the 1st of each month. Advertising and editorial forms close on the 15th. Subscription price, one year: Domestic, $1.50; foreign, $2.50; two years: Domestic, $2.50; foreign, $4.00; three years: Domestic, $3.00; foreign, $5.50; single copies, 25c. Chas. F. A. Mann, Northwest Representative, 1110 Puget Sound Bank Bldg., Tacoma, Washington. New York Office, Suite 404-405-406, Two Hundred Broadway, Telephone COrdlandt 7-3579.

In New York City copies of Pacific Marine Review can be purchased at the news stands of I. Goldberg, 42 Broadway; Harry Nash, 17 Battery Place; Philip Mandara, Greenwich Street and Battery Place. In Washington, D. C., at the news stand of the Carlton Hotel, 16th and K Streets.

J. S. Hines
President and Publisher

B. N. DeRochie
Assistant Publisher

Alexander J. Dickie
Editor

Paul Faulkner
Advertising Manager

F. Dryden Moore
Assistant Editor

PACIFIC MARINE REVIEW

VOLUME XXXV DECEMBER, 1938 NUMBER 12

Editorial Comment

Let's Start the Rivet Guns

The Pacific Coast is rapidly becoming the strategic frontier of the defense plans of the United States. Ideas of the Army and Navy for this coast contemplate huge expenditures for such necessities as: Navy supply bases. Naval airports. great expansion of Navy yard facilities. complete overhaul of Army posts. establishment of Army airports, building of military roads, and super coast defense guns.

All past experience and present counsel indicate that these preparations. vast as they are. will be of very little value without a well-rounded-out shipbuilding plant to create and maintain the auxiliary and transport fleets needed by both divisions of the military services in any time of emergency.

The nucleus of such plant is here. All that is necessary to produce the much needed expansion and perfection of that plant is the placing of contracts by the U. S. Maritime Commission. the U. S. Navy. the U. S. Coast Guard. Lighthouse Service. Coast and Geodetic Survey and other departments of the Federal Government.

As has been demonstrated in previous experience. the placing of such contracts will cause a flow of capital into the shipbuilding enterprise and a consequent enlargement and improvement of shipbuilding facilities to meet all requirements.

It is a rather unusual and very fortunate circumstance that the present replacement needs of the American merchant marine on the Pacific Coast are to a marked degree identical with the needs of merchant tonnage for emergency auxiliary services to Army and Navy.

This fact makes possible a high degree of cooperation and coordination between the commercial shipowner and shipbuilder and the various interested Federal bureaus.

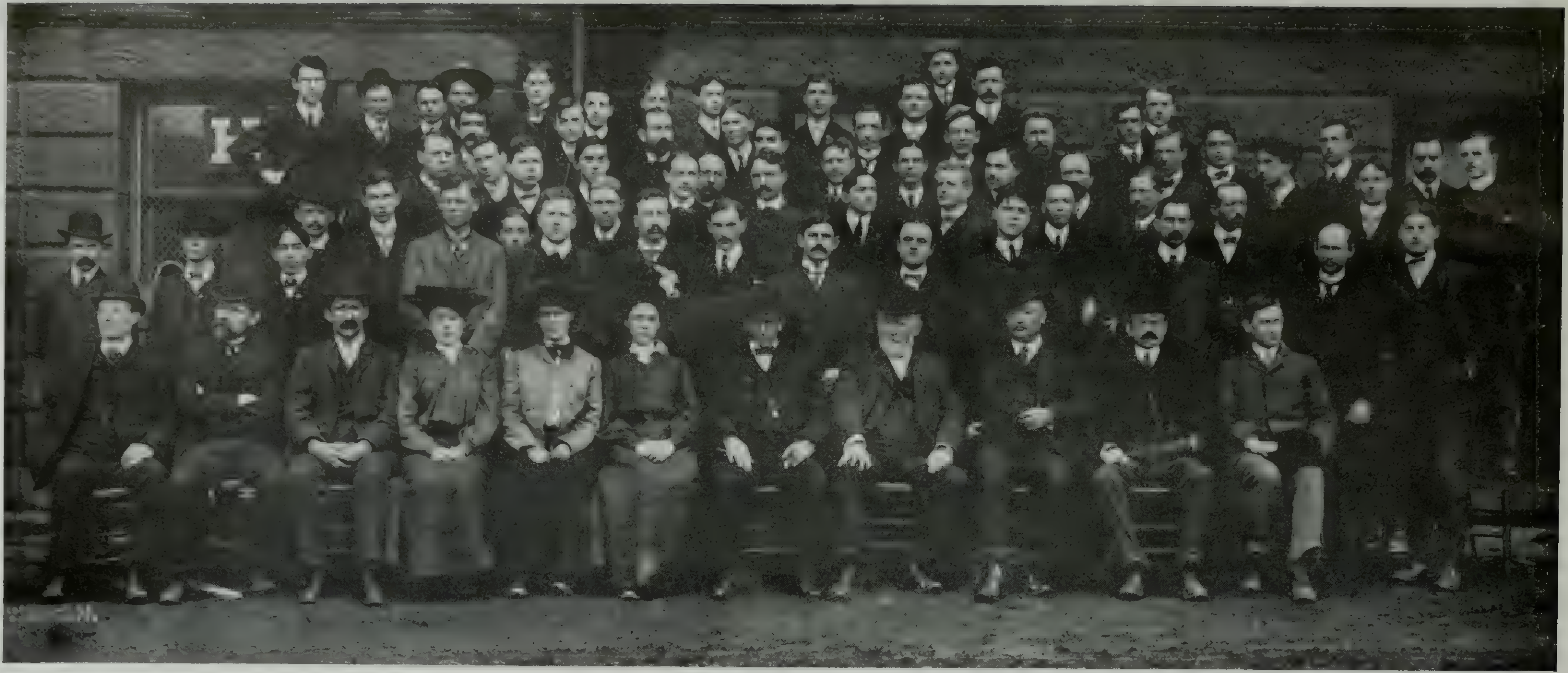
From the Government viewpoint it is not only possible. but highly desirable. to encourage commercial shipbuilding on the Pacific Coast. and certainly such encouragement would be far more economical than the establishment of Government-owned shipyards here. as has been suggested from certain quarters in Washington.

The capital required to build and operate modern shipbuilding plants would. if used in subsidies for offshore and intercoastal shipbuilding. create both the shipbuilding plant required and the modern merchant marine fleet needed for commerce as well as for national emergencies.

As we write. Mr. Joseph Moore. a San Francisco shipbuilder. is being called to Washington to confer with the U. S. Maritime Commission on the possible award of some C-3 design vessels to his yard. The best wishes of all maritime interests on the Pacific Coast go with Mr. Moore on this trip. We all know that a contract for such vessels anywhere on the Pacific Coast is not only of direct benefit to the whole Coast but is very surely the forerunner of many other contracts.

The sound of the first rivet guns on the keel plates of such ships in any Pacific Coast yard will be a note of joy from San Diego to Puget Sound.

Let's Start Building Pacific Coast Ships in Pacific Coast Shipyards.



PACIFIC COAST STEEL SHIPBUILDERS 35 YEARS AGO

This group is the technical staff of the Union Iron Works, San Francisco, taken 1903 or 1904, just before the plant was taken over by Bethlehem.

Front row, seated, left to right: John T. Scott, shop superintendent; Knut M. Dahl, chief engineering draftsman; Jas. McKinlay, asst. ch. eng. draftsman; Ada Harris; Harriet Scott; Rosa La Mont; J. J. Jeffries, manager; Geo. W. Dickie, consultant; Willis G. Dodd, president; H. P. Frear, chief hull draftsman; and Wm. S. Dickie, asst. ch. hull draftsman.

Just back of McKinlay's left shoulder stands Berry Dunn, and on his left, James U. Smith. Directly back of Frear is Truett, and back of Wm. Dickie's left shoulder is Geo. Muller. In the third row back from Geo. W. Dickie's right shoulder is Joseph P. Baloun, and in back row, on the line between Miss La Mont and Jeffries, is the late Carl V. Lane.

Pick out your own acquaintances and perhaps yourself. The rest include:

James Robertson, Anderson, Geo. Sakai, Harry Haley, John O. Hanson, Frank Drew, Boynton, Beatty, N. F. Raymond, Sandelin, Louis Jurs, Tomilson, A. S. Warburton, W. A. Atkinson, Oiset Jacobsen, W. Buckel, Chas. Drew, Fred Wilson, Geo. Burnap, Arthur Bordwell, Pierson, Fred Scheffauer, Harry McPhee, Legarda, Muir, Wm. Richardson, Chris Mues, Ferres, Milvin Williams, Chas. Taylor, Ed. Walker, Chas. Smith, Peterson, Cooper, Arthur Robinson, Gordon, John Cameron, John Dykman, Daly, Merton Hinton, and Archer.

Some Famous Pacific Coast Shipbuilders

DEPARTMENT HEADS, UNION IRON WORKS, SAN FRANCISCO, AS OF 1893-1895

Front row: Pengelly, joiner shop; O'Neill, foundry; Dan. Fraser, heavy machine shop; Matt. Arnold, ass't superintendent; John T. Scott, superintendent; James Dickie, superintendent of shipyard; Mike Haley, light machine shop; Cronin, boiler shop; and Hamilton, boiler installation.

Middle row: McAllister, pattern shop; W. W. Hauscom, electrical department; Knut Dahl, chief engineering draftsman; Hugo P. Frear, chief hull draftsman; Wm. Donald, ship fitter; Young; and Irving M. Scott, Jr., material handling.

Back row, left to right: Jim Eddy, engine installation; Doyle, blacksmith; Telford, shipsmith; McKenna, riveter; Tom Jarvis, engineer drydocks; Manuel, storekeeper; Olson, coppersmith.

The pictures on this and the facing page show most of the men whose technical skill and knowledge made the old Union Iron Works of San Francisco famous as a steel shipbuilding plant during the nineties of the last century.

These were the boys that really built such ships as the battleship Oregon and the cruiser Olympia for the United States Navy. They not only built many such ships but they built every piece of machinery and equipment that went into the propulsion plant and auxiliary plant of such ships.

In between times they repaired all the steel vessels that needed repairs and found time to build a large share of the mining machinery needed not only for California but for all the Western States and most of the countries bordering on the Pacific Ocean.

They also built many of the early steam electric plants for the public utilities of the Pacific Coast.

They designed and built the dome for the Lick Observatory and the hydraulic machinery for its movable floor.

Nothing was too difficult for this gang to tackle. And with all their struggle and the fact, as its plainly evident from the pictures, that they had little time for the amenities or even for pressing their clothes, these men found time to impress their spirit, their skill, and their knowledge on a host of apprentices who today are the backbone of Pacific Coast industry and furnish many of its executives.

For 25 years they maintained the Union Iron Works as a top notch American shipbuilding establishment, unique in that it was a solitary outpost 3000 miles or more from the nearest similar establishment.

What we need today to get ships to build in our Pacific Coast yards is more of the spirit of cooperation in a united effort to bring the work here. Our yards can build the ships. But every man who lives on this coast will benefit by that building, and every such man ought to use every bit of influence he has to back up the shipyards in their efforts to get a good share of this shipbuilding work.

Largest Diesel Order In West Coast History

Charles Cox, manager of the Enterprise Engine Company of San Francisco, announces that notice of award has been received from U. S. Navy covering the following:

A total of 10 engines aggregating 6500 horsepower called for under United States Navy Schedule 4484 for five diesel electric harbor tugs. Two of the tugs are for the Navy yard at Bremerton, Washington; two for Charleston, S. C.; and one for Norfolk, Virginia. Each tug will have 1000 shaft horsepower.

Two 650 horsepower Enterprise diesels each driving a Westinghouse generator will be installed on each tug. Each tug will have two 500 shaft horsepower Westinghouse propelling motors geared to shaft with Westinghouse reduction gears.

Enterprise Engine Company recently supplied two similar diesel engines to the U. S. Navy tug YT-128 at Boston Navy Yard.

Ten duplicate 650 horsepower diesel engines is a very nice order, and we congratulate the Enterprise Engine Company for bringing it to San Francisco.

With The
NAVAL ARCHITECT and MARINE ENGINEER

The 46th Annual Meeting of America's Premier Marine Technical Society Produces Ten Interesting and Instructive Papers on Widely Varying Subjects.

Ten papers on a variety of technical marine subjects were presented before the 46th annual meeting of the Society of Naval Architects and Marine Engineers on December 1 and 2.

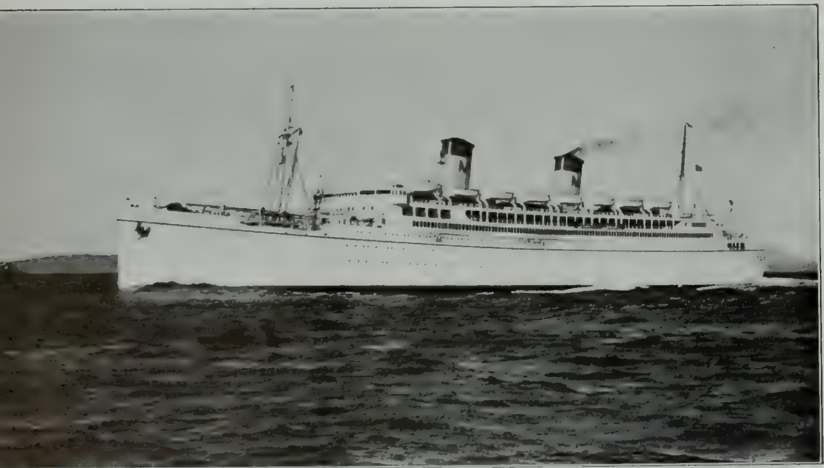
The first session of the general meeting was opened at 9:30 a.m. December 1 for the presentation of two papers and discussion pertinent thereto by the members and visitors. The first paper, entitled "Care of Cargo at Sea," by Oliver D. Colvin, member, and W. H. E. Hahne and Mark R. Colby, visitors, outlined the causes and prevention of damage to ship cargo. A thorough investigation was made by the authors into the effects of such damage-producing factors as corrosion, tainting and staining by odors, gas, moisture, bacteria and fungi, vermin and fumigation, spontaneous heating of organic substances, and fire. From the analysis made of these factors the authors presented some suggestions for improving present methods of protection through better regulated mechanical and chemical ventilation. A fairly complete abstract of this paper starts on page 30 of this issue of Pacific Marine Review.

The second paper, by Lieutenant Commander H. S. Schade, Construction Corps, United States Navy, member, presented an explanation of a "Bending Theory of Ship Bottom Structure." The problem investigated is that of bending deformations and stresses in the bottom structure of a ship, resulting from the distributed loads, which include hydrostatic pressure and distributed weights, and concentrated loads, which include stanchion loads and concentrated weights. Commander Schade, in developing this study, has regarded the bottom structure as a special case of the orthotropic plate, which is defined as a homogeneous plate whose elastic properties are different in the two orthogonal directions in the plane of the plate.

Following a buffet luncheon held in the lounge restaurant of the Waldorf-Astoria, the second session convened at 2:00 p.m. to hear three additional papers.

The problems involved in the design of excursion vessels were described in a paper on "The Modern Excursion Steamer," by Lawrence O. Campbell, member. Mr. Campbell, who has been active in the reconstruction of several vessels for excursion service, discussed the various factors which are involved in the design of an excursion vessel from the standpoints of freedom from such hazards as fire, instability, cost and public appeal.

A paper on "Recent Developments in Great Lakes Self-Unloading Bulk Cargo Vessels," by Albert W. Cross, member, followed. In this paper Mr. Cross described and dis-



In the Mariposa (shown here), Monterey, Lurline and Matsonia, the Matson Navigation Co. of San Francisco have the largest, finest, fastest quartette of steamers operating under one management in the American Merchant Marine.

Artist's conception of the steamer designed by the Mississippi Steamship Company and the U. S. Maritime Commission for New Orleans-South America service.

cussed the structural design and operating problems involved in the large ore and coal carrying vessels built and equipped for self-unloading. These vessels are capable of discharging bulk cargo at rates of 2000 long tons per hour and over. The first day's meeting closed with a paper entitled, "New Uses for Rubber in Ship Construction," by Herbert Christophersen, member. This paper outlines some uses for rubber in preventing corrosion and wear on ships' equipment exposed to water and corrosive agents. A full abstract will be found in this issue of Pacific Marine View, beginning at page 34.

The third session, convening Friday morning, December 2, included three papers.

"Heat Balance Calculations for Marine Steam Plants," by A. S. Thaler, member, and D. C. MacMillan, junior member, was the first paper in this session. Following a brief description of the uses and principles involved in heat balance calculations for marine steam plants, this paper presents complete outline figures for one method of preparing these calculations.

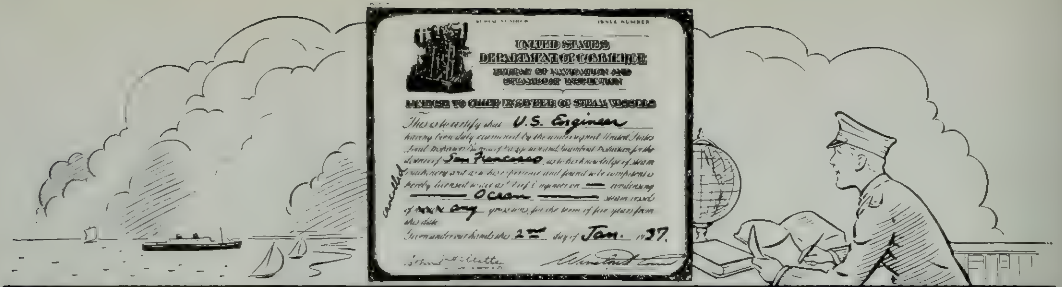
George P. Haynes, member, and Samuel Letvin, visitor, presented the second paper of the day, on "A New Fuel Oil Burner." A comprehensive discussion of the variable capacity fuel oil atomizer recently developed by Todd Combustion Equipment Inc., the manner in which it functions and the need and utility of such a device in the combustion field were set forth by the authors. A full description of this device was published in the November issue of Pacific Marine Review.

The last paper of the morning session was "Some Notes on the Use of Models in the Study of the Rolling of Ships," by Professor Henry C. Adams, 2nd, member. Professor Adams discussed the results of a study resulting from a series of experiments with models which were made from lines of actual vessels used by William Froude, the great English naval architect and scientist, in similar experiments in England over a half century ago.

The fourth and final session of the general meeting in the afternoon included the election of new members and the presentation of two papers. "The David W. Taylor Model Basin at Carderock," by Commander Harold E. Saunders, Construction Corps, U.S.N., council member, was the first paper. It was a general description of the construction and design of the new model basin now building by the Government at Carderock, Maryland. This basin will be used for the towing of models of surface and subsurface craft to determine the most suitable and desirable hull form and appendages to be adopted for United States vessels, both merchant and naval, and for the investigation of other problems of ship design.

The general technical meeting closed with the presentation of a paper on "Old Plans of Historic Ships," by Joseph C. Wilson, visitor. Mr. Wilson, through his connection with the Bureau of Construction and Repair, Navy Department, has had the opportunity to examine a large number of old ship plans stored in the vaults at the Washington Navy Yard. From his investigation he selected for discussion a number of plans of vessels which represent interesting historical development in ship construction and design.

These are all excellent papers in their separate spheres, but to the editorial observer of maritime progress in the United States the program of this meeting seems to avoid our real problems. Here we are all excited over the rebuilding of our merchant marine and a large increase in our Navy, but our most important maritime technical society shuns completely any discussion of the new ship designs which are multiplying in Washington, or any constructive suggestions for our great shipbuilding program.



UNITED STATES
DEPARTMENT OF COMMERCE
BUREAU OF NAVIGATION AND
STEAMBOAT INSPECTION

LICENSE TO CHIEF ENGINEER OF STEAM VESSELS

U.S. Engineer

San Francisco

Cancelled

Ocean

any

2nd day of Jan. 1937.

Your Problems Answered

by "The Chief"

The word "Cancelled" was inscribed on face of the above license at the direction of the Bureau of Marine Inspection and Navigation. As used here it means "Specimen Copy."

Vacuum and Its Effects on Plant Operation

In my many contacts with engineers, both ashore and afloat, I have found a surprising degree of uncertainty and misunderstanding regarding the terms vacuum, absolute pressure, gage pressure, barometer pressure, and other specific pressure terms.

Looking toward clearing up some of these points, I propose the following:

Let the reader study the listed questions and formulate the answers in his mind. Then after finding the answer, check it with the answers given at the end of this article, bearing corresponding numbers. If you do not agree with these answers, write to us for further details.

THE CONDENSER

Question: Will temperature truly indicate the vacuum?

Answer: The operation of the condenser can affect the economy of the propulsion plant as much or more than the operation of any other unit in that plant.

If a perfect vacuum were pumped the absolute pressure would be zero lbs. per sq. inch. The poorer the vacuum the lower the inches of mercury on vacuum gage, and the higher the absolute pressure. Thus drop vacuum 2 inches and we raise absolute pressure 1 lb. per sq. in.

QUESTIONS ON VACUUM

(1) A steel bottle is charged with carbon dioxide gas so that its pressure gage reads 100 lbs. per sq. in. at sea level. Neither the bottle nor gage and fittings leaks and no gas may pass in or out. This bottle is placed inside of the condenser and the vacuum pumped until it is practically the same as the barometer, say 29½ inches of mercury. Will the gage on the bottle read more or less, and how much, with no change in the amount of gas in it?

(2) If this same bottle were taken up aloft in a plane where the barometer reads 20 inches, what will the gage read?

(3) Will the stress on the steel of the bottle be affected as indicated by the gage, that is, will there be more or less load on the steel where the gage reads more or less?

(4) This steel bottle is now placed in a boiler and the hydrostatic test applied to the boiler. A window is provided to read the gage on the bottle. The boiler gage is brought up to 100 lbs. per sq. in. What is the reading on the gage on the bottle?

(5) A 30-inch barometer is equivalent to about 15 lbs. per sq. in., 14.7 to be more nearly exact. Thus 2 inches of mercury is equivalent to 1 pound per sq. in. A boiler carries 80 lbs. per sq. in. when the barometer reads 30 in. If suddenly the barometer falls two inches, what will be the effect on the gage reading of the boiler?

(6) If the safety valve would blow at 80½ lbs. normally, would it lift under conditions of question No. 5?

(7) If the answer to question No. 5 is more or less than 80 lbs., would the temperature be more or less to correspond?

(8) Would the two-inch drop in barometer in question No. 5 above affect the reading of the vacuum gage in the engine room? If so, how much and which way?

(9) Would the temperature in the condenser change any under a change in barometer and vacuum gage, as indicated above?

(10) A portable steam condensing plant normally at sea level shows 100 lbs. gage and 29 inches vacuum. It is transported to an elevated place in the mountains and operated so that the strain on the shell is the same when the barometer shows 20 inches, or 2/3 of sea level. With the same absolute pressure in the condenser as before:

(a) What is the boiler gage reading?
(b) What is the dial vacuum gage reading?
(c) Is the temperature of the steam more or less?
(d) Is the available horsepower more or less?
(e) Is the temperature in the condenser more or less?

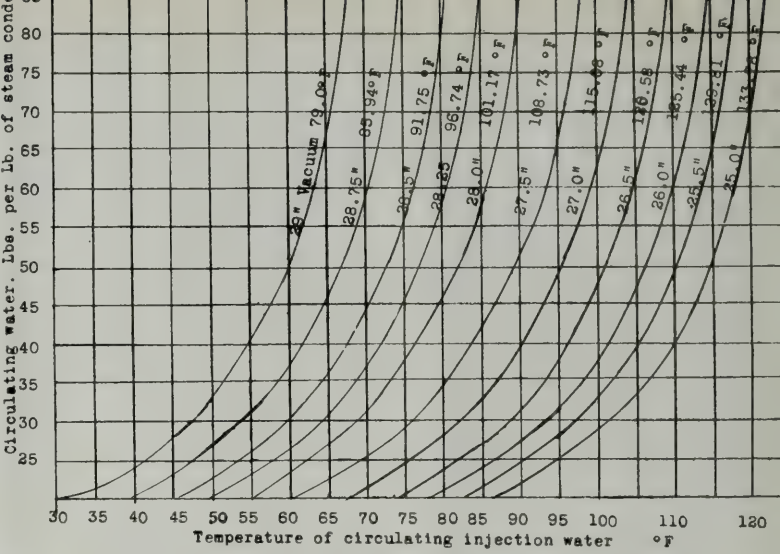


Fig. 1. A graph showing quantities of circulating water required for various conditions of vacuum and temperature.

Or a vacuum of 28 inches is an absolute pressure of 2 inches, or 1 pound per sq. in. The difference between the barometer reading and the vacuum reading on dial gage is the absolute pressure.

For water vapor or steam in a saturated condition (wet steam) the absolute pressure is a function of the temperature. (See steam tables for values.) One varies definitely up and down with the other. For any temperature the absolute pressure is fixed. Thus, if the vapor in a condenser is free from gases or air the temperature of the vapor would give the absolute pressure, according to the table herewith:

Absolute pressure inches	Temperature degrees F.	Vacuum based on 30" Barometer
1.0	79.0	29.0
1.2	84.7	28.8
1.4	89.5	28.6
1.6	93.8	28.4
1.8	97.7	28.2
2.0	101.2	28.0
2.2	104.4	27.8
2.4	107.3	27.6
2.6	110.0	27.4
2.8	112.7	27.2
3.0	115.0	27.0
3.5	120.6	26.5
4.0	125.4	26.0
4.5	129.8	25.5
5.0	133.8	25.0

However, it is impossible to have air free vapor in a condenser, due to absorption of air by feed water and to leaks. Hence, the temperature of the vapor in a condenser indicates the absolute pressure only of the water vapor. The absolute pressure of the air and gases is over and above this amount, so that the absolute pressure indicated by a U tube or gage with barometer will always be more than that indicated by the thermometer.

With an accurate vacuum gage the difference between it and the barometer is the total absolute pressure. The difference between this total and the absolute pressure indicated by the thermometer is the air or gas pressure, and roughly is a measure of the air leakage. If there is any air present the thermometer indicates a better vacuum than actually exists.

In the exhaust connection the ratio of air to steam is so small that the thermometer indication should check the gage pretty closely. The vapor condenses as it passes into the condenser. Thus at about mid point or lower the air to steam ratio may be high and thermometer and gage differ by an inch or two.

A study of this effect and particularly as it changes from day to day will tell whether our loss in vacuum is due to air leaks or temperature of circulating water.

Question: How much cooling water is required for a condenser?

Answer: Figure 1 is intended to show how much water is needed through the circulation system to condense a given amount of steam for different vacuums and water temperatures. These curves have allowed a 10° F. difference in average temperature to force the heat through the walls of the tubes. Practice indicates that the injection water must be cooler than the temperature corresponding to the vacuum by an amount called the terminal temperature difference. This may be 5, 10 or 15° F. To use Fig. 1 modified for the terminal difference add it to the injection temperature. Thus, suppose we want a terminal difference of 13° F. and have injection water of 68° F. 68 + 13 is 75° F. Then, for a 28.5" vacuum we would need 55 pounds of circulating water per pound of steam condensed. This is an approximate figure for practical conditions. The temperature rise of the circulating water is usually 15 to 20° F. This is not the terminal difference. The latter should be kept as small as possible, as we do not want to cool the condensate down to a temperature lower than necessary.

Although generally stated that the better or higher the vacuum the more power and economy, this is not necessarily true. On account of the tremendous increase in volume with an increase of vacuum the engines and turbines will not develop more horsepower or economy at vacuums higher than those for which they are designed. In the range from 28" to 29" vacuum steam doubles in volume, requiring increased area in valves and trunks to handle it. The reciprocating engine usually is designed for 25½ to 26". To run condenser at better vacuums only cools off the hot well unnecessarily. Regardless of how good the condenser vacuum is, the indicator does not show any improvement or lowering of back pressure on engine, due to the restricted area of ports.

Marine turbines are usually designed for about 27½ inches at the last row of blades, allowing ½ to ¾ inch to move the steam to the condenser operating at 28 or 28¼ inches.

Our next article will continue this discussion of condensers.

Answers to Special Questions on Vacuum Appearing at the Beginning of this Article

(1) The gage will read approximately 115 lbs. pressure, due to lowering the external pressure about 15 lbs. to increase the differential by that amount.

(2) 20″ barometer is 2/3 of 15 lbs., or 10 lbs. per sq. in. atmospheric pressure. The gage would read 100 plus 5, or 105 lbs.

(3) Yes, the load on the steel follows the gage.

(4) The gage would read zero.

(5) The gage would move up to 81 lbs. per sq. in.

(6) Yes, it blows on the differential pressure.

(7) No, boiling point is affected by absolute pressure.

(8) If all openings to pumps, etc., are closed, there will be no change in reading of the mercury vacuum gage or U tube. The dial gage of the Bourdon type, however, will be affected and will show two inches lower or poorer vacuum. It will always show a vacuum which is the same amount below the barometer. Thus, if we were using 28½ inches and barometer dropped 2 inches, the gage would read 26½ inches.

(9) No, temperature would not change as no change in absolute pressure.

(10) (a) 100 lbs. per sq. in.
(b) 19 inches.
(c) Less.
(d) Less.
(e) No change.

Note: These questions are not necessarily practical ones, but are intended to promote thoughtful speculation, a desirable practice for all of us.

PROVIDES AMAZING STATISTICS

A ribbon of paper 11,000,000 feet long and five feet wide has begun whirring through the presses to form 82,000 copies of the new 1939-40 General Catalog listing some 100,000 styles and sizes of products of the Westinghouse Electric & Manufacturing Company. On its pages is written the story of electric power, from generators to washing machines and toasters, from titanic steel motors to tiny one-twentieth horsepower motors to drive electric shavers. Edited at the East Pittsburgh Westinghouse works, the new catalog will have provided more than 26,000 man-hours of work.

If piled on top of one another, the completed catalogs would make a paper tower rising three and a quarter miles into the sky, but even their combined mass of 646,406 pounds of paper does not tell all the story of Westinghouse production, as many renewal parts are not listed.

More than 16,000 yards of book cloth were required to bind the fifteen carloads of paper and each catalog will contain 3,700 photographs. The printed words will consume 4,300 pounds of ink, 17,864 pounds of type metal and 5,544 pounds of nickel-types.

FLOODS FAIL TO DAMAGE BELTS

The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., has just been informed that, for the third time within three years, two of their Condor Compensated Belts have successfully weathered a destructive flood following the recent New England hurricane at the plant of Prospect Mills, Inc., Lawrence, Mass.

The Compensated Belts, installed early in December, 1935, on two horizontal water wheel drives, were under water for five full days in September when part of the Prospect Mill's plant was flooded, yet there have been no repairs or adjustments made to the belts by the user and the belts are running satisfactorily.

A New Bearing Industry

The Howarth Pivoted Bearings Company announces the opening on November first of its offices and factory at Ontario and Twenty-third Streets in Philadelphia, where it will manufacture an extensive line of oil film bearings of thrust and journal types that function with perfect lubrication.

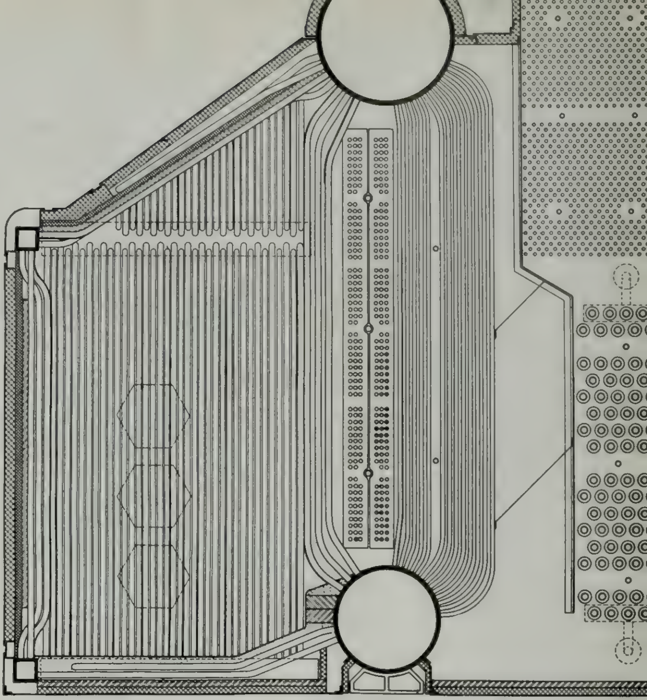
Pivoted bearings are now a recognized type, having been before the engineering world for about thirty years as Kingsbury thrust bearings in this country and as Michell thrust and journal bearings in England and on the Continent. The fundamental inventions underlying these bearings were made by Albert Kingsbury in New Hampshire in 1898 and by A. G. M. Michell in Australia in 1904. Both inventors acknowledge indebtedness to the mathematical analysis of Tower's experiments by the eminent English physicist, Osborne Reynolds.

H. A. S. Howarth, who heads this new company, was associated with Albert Kingsbury and his company for twenty-four years until June 1, 1938, and has many important inventions in bearings to his own credit. He announces that his company will build bearings of improved Kingsbury and Michell types.

This is an independent company formed by H. A. S. Howarth and M. J. Howarth. It is equipped to design, manufacture and service its product.

Such bearings up to 8 feet diameter are used as thrusts in hydroelectric units and in small sizes down to 3 inches diameter in steam turbines and centrifugal pumps. They are the accepted type for propeller thrust bearings in merchant and naval vessels.

EVOLUTION IN MARINE FURNACES



"D" type boiler for Class C-2 steamers, complete with convection superheater, economizer and air heater.

The first "D"-type Foster Wheeler marine steam generators were used in the oil tankers R. P. Resor and T. C. McCobb in 1935. They were fitted with air heaters and economizers and made such a mark in the American Merchant Marine that 72 more "D"-type boilers were subsequently ordered in two and a half years. The fact that many of these were repeat orders demonstrated the aggressiveness of marine operators in seizing upon improvements for their propulsion equipment as soon as the reliability and practicability had been demonstrated.

The original furnaces used with the "D"-type steam generators had water cooling in the floors, side wall and roof. Some of the more recent units had additional water cooling in the back wall opposite the burners. The ultimate in water cooling of these furnaces appears now in the "D"-type steam generating units for C-2 class steamers under construction for the U. S. Maritime Commission, at the yard of the Federal Shipbuilding & Dry Dock Company, Kearny, N. J. In addition to a greater area covered, there are more tubes for the same space. For example, the side wall has two rows of tubes whereas only one was used in the original design. Furthermore, there are more tubes in the floor and roof to provide for the necessary circulation in the side and end walls. Vertical baffles of alloy steel are employed. Two units will be arranged in a single steel setting to provide the entire steam requirements for each individual ship.

Many of the "D"-type boilers which followed the original installations were constructed without air heaters. This omission did not appreciably lower the overall efficiency of the units since the heat absorbing capacity of properly designed economizers was sufficient to reduce stack temperatures to 300 deg. F. or less.

Reference to the drawing will show that the general design of the "D"-type has been maintained, the fundamentals being a large water-cooled furnace in which oil may be fired at high efficiency without overheating the furnace; a boiler section of vertical tubes connected to a steam drum at the top, and to a water drum at the bottom; a convection superheater placed behind a slag screen; an extended surface, marine economizer; and a tubular air heater. The combined effects are notable, and include:

1. Maximum absorption of radiant heat from the furnace.
2. Minimum loss of heat from the furnace by radiation through the casing.
3. Minimum tendency for the accumulation of slag on the superheater.
4. Superheater accessible for cleaning from the furnace.
5. Maximum heat recovery from the furnace gases through the use of an economizer and air heater in combination.

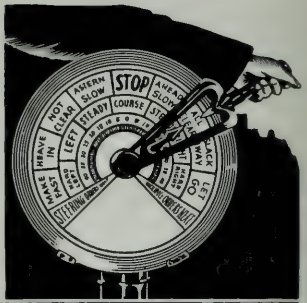
The design immediately impresses one with the purpose to effect extensive heat transfer at the highest heat level—by radiation in the furnace—and to effect all practicable recovery from the low temperature gases on the way to the stack. Such a combination gives great effectiveness in small space.

Accessibility of a high order is obtained through placing all superheater, economizer and air heater tubes in a horizontal position. Any tube connection is immediately reached through doors for inspection or cleaning. Should it ever be necessary to replace any of these tubes, each can be removed and a new one installed without disturbing the others. All tubes of the boiler proper are connected to the two drums and may be inspected and cleaned by opening only two manholes—one in each drum. The waterwall tubes are joined to suitable headers at the front, back and side walls of the furnace, in addition to the two drums. This makes all waterwall tube connections as readily accessible as those of the economizer or boiler. Facility of maintaining the previous "D"-type boilers has been the cause of much favorable comment, and it would appear from the drawing that no complication has resulted from the

(Page 33, please)

Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A DEPARTMENT FOR DECK OFFICERS

AIR-BORNE DAMAGE TO SEA-BORNE CARGO

Deck officers are charged with responsibility for cargo stowage, care of cargo through the voyage and proper delivery on arrival. Much damage is incurred by cargo at sea. Claims for such damage are enormous. Expensive insurance is carried by ship operators to protect themselves from such claims. Therefore deck officers should inform themselves on the causes of such damage and should exercise care and forethought in protecting cargoes therefrom.

One of the great primary causes of damage to cargo, and one that is very little understood or even studied, lies in the air of our sea level atmosphere and in its ability to: absorb, transmit and change moisture conditions; absorb, transmit and change chemical reagents; create direct and under certain conditions very rapid chemical action; absorb and transmit objectionable odors and contaminations; and carry the spores of many destructive fungus growths.

Modern trends in marine transportation (such as change from wood to steel in hull construction, increased speeds, lack of conditioning of produce before shipping, greater discrimination among buyers) are continually increasing the hazard from the atmosphere and the damage and claims arising because of that hazard.

We are fortunate in being able to reproduce for our readers the very latest study on this subject, as presented to the Society of Naval Architects and Marine Engineers at New York on December 1, 1938. This paper was prepared by:

Oliver D. Colvin, Assistant Chief Engineer, Carnation Milk Company, Milwaukee, Wis; Werner H. E. Hahne, Research Engineer, Cargocaire Division, Colby Steel and Engineering Co., Seattle, Wash.; and Mark R. Colby, President, Colby Steel and Engineering Co.

The heart of the paper follows:

● Properties of Air

Atmospheric air is a mixture of numerous ingredients, of which the gases nitrogen, oxygen and the vapor of water are the most important. Among the gases, oxygen is the most important, as it comprises about 21 per cent and is essential as a means of supporting the respiration of most living organisims including vermin, insects and mold bacteria. Oxygen is also a powerful chemical agent and prone to combine with numerous other substances. This process, which takes place often together with moisture, acids and other chemicals, is called oxidation, corrosion, rusting, respiration or combustion, depending on its intensity and circumstances.

Air can carry other gases, vapors, liquids and solids in suspension. Among the gases, carbon dioxide and carbon monoxide are of importance as the products of oxidation, combustion and respiration.

Among the vapors, water vapor is most important, which is discussed in detail below. Other vapors of importance in cargo holds are explosive vapors from gasoline, alcohol, ether, essential and other oils. Also important are the odorous vapors and fumes, which usually occur in infinitesimal quantities but cause much damage by tainting and corrosion.

Among the solid particles, which are commonly called dust, the following are of importance: the explosive dusts of grain and coal, and numerous kinds of dust which are a nuisance because they render much cargo unsightly and may cause damage. Bacteria and fungi are classed under this section.

When air is warmed, it expands; when cooled, it contracts. One pound of air at freezing temperature has a volume of about 12.5 cubic feet and at 100 degrees about 14.5 cubic feet.

● Moisture in Air

Much damage to cargo is caused by the activities of moisture in air. Atmospheric air always contains a certain measure of moisture in the form of invisible vapor, even when the air appears to be perfectly dry to the touch. At a certain given temperature air cannot carry more than a definite amount of water vapor. In this condition the air is said to be "saturated with moisture."

The moisture content of the air is expressed in grains of vapor per

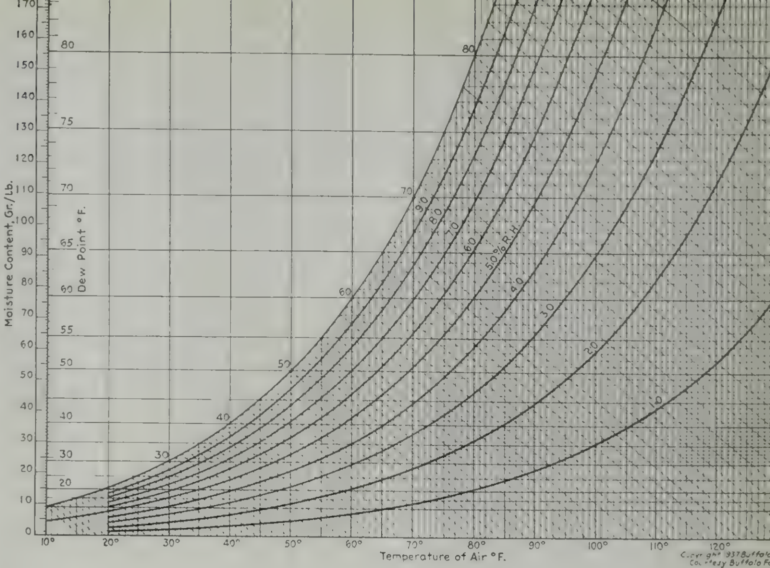


Fig. 1

pound of dry air. For instance, saturated air at a temperature of 70 degrees contains 110 grains per pound (Fig. 1).

Warm air can carry more water vapor than cold air. Therefore, if saturated air is cooled off, some of the water vapor is percipitated from the air in the form of visible water. This process is called "condensation of moisture." It is very similar to the crystallization of sugar from a saturated sugar solution, when it is cooled. The water, which is condensed from the air, will appear either as dew, fog, rain, snow, hail, frost or as dripping condensation, depending on circumstances. As an example, saturated air of 80 degrees can carry 156 grains per pound, and saturated air of 32 degrees can carry 26 grains per pound. This means that an empty cargo hold of 100,000 cubic feet grain capacity, which is filled with saturated air of 80 degrees, contains about 157 pounds of water vapor. The same space filled with saturated air of 32 degrees can hold only 29 pounds of water vapor. Therefore, when the ship sails suddenly from hot into cold weather, as stated, and this hold is kept sealed, about 128 pounds of dripping condensation will appear on those sides of the hold which are exposed to the cold weather. It will be shown later that moisture may come from the cargo itself or from the outside air.

If air contains less water vapor than it could actually carry at a given temperature, the air is "unsaturated." The degree of saturation of air is called its relative saturation, or, as it is better known, "relative humidity." Saturated air has a relative humidity of 100 per cent and dry air a relative humidity of 0 per cent. The air above the sea is normally between 60 and 90 per cent saturated.

When unsaturated air is cooled off, its relative humidity rises, until, at a definite temperature, it becomes saturated. Upon further cooling, dew or fog condenses from the air. This temperature at which a certain sample of unsaturated air would become saturated, when cooled, is called "the dew point" of the air. For instance, air of 80 degrees temperature and 70 per cent relative humidity has a dew point of 69 degrees. The dew point varies directly as the moisture content. The dew point is the most important concept with which this paper will deal.

When saturated or unsaturated air is heated, its relative humidity falls, because at the higher temperature the air can carry more water vapor than at the lower temperature. Heating of air makes it "relatively drier" and drier to the touch, but heating of air does not change its dew point or its moisture content. This should be noted!

The exact relations between the moisture content, the dew point, the temperature and the relative humidity in air have been established in the form of tables or diagrams, which are called phychrometric tables or charts. The attached chart (Fig. 1) is a preferred form. One can trace on it all of the data given above. It is extremely useful for proper care in the carriage of goods, as will be explained in detail later.

Note: The mariner of earlier days thought that the hull of a ship could "sweat" similarly to the human skin, and therefore called the condensation on the overhead deck and sides of the cargo hold "ship's sweat." Unfortunately, this term is used without much discrimination in marine insurance policies for several kinds of moisture damage. This term should not be used, because it is misleading and confusing with other activities of moisture.

● Moisture in Cargo and Moisture Transfer

(1) Definitions. Not only are the ship and cargo at all times surrounded by moisture in the form of vapor in air and liquid water, but a great amount of moisture is also contained within the cargo itself. In spite of the fact that many products appear perfectly dry, they may have a moisture content of several per cent, which may become active.

Free moisture is that moisture which is visible on the surface of cargo, and also that moisture which is contained in the capillary spaces and pores of certain products. This free moisture may get to the cargo by way of rain, snow, direct condensation, sea water spray, artificial wetting, etc. A change in the content of free moisture usually affects the weight of the substance only. Examples are steel, which is wet from rain or condensation, wet brick, coke and sand.

Hygroscopic moisture is chemically combined with the substance and a change in the content of hygroscopic moisture materially affects its properties such as hardness, plasticity, coherence, color, volume, etc. Typical examples of hygroscopic products are most materials of plant and animal origin in an air-dry condition, such as lumber, paper, grain, hemp, wool and leather.

Some inorganic products have the property of taking on or giving off water and may therefore also be called hygroscopic. However, the processes involved in moisture transfer with inorganic commodities are different and involve (1) the physical adsorption of moisture such as by silica gel or alumina gel; or (2) water of crystallization such as many chlorides, sulphates and nitrates of metals and metalloids; or (3) chemical processes such as the hydration of cement, plaster, etc.

Both free and hygroscopic moisture are contained in porous hygroscopic products, when they are in a green or wet condition, such as green lumber, fresh fruit, wet bags.

A mixed cargo normally contains a considerable amount of both free and hygroscopic moisture amounting to several per cent of the total weight. It should be noted that the materials used for wrapping, packaging and dunnaging, such as cardboard, kraft paper, dunnage lumber, box shooks, bags, matting, etc., form a substantial portion of all cargoes and usually contain much hygroscopic moisture, which may become active.

(2) Evaporation of Free Moisture. Liquid water and ice have an internal pressure, which induces molecults of water vapor to leave the body of water and enter the contacting air. This process is evaporation of water and the pressure which causes water to evaporate is called the vapor pressure.

Water vapor that is invisibly dissolved in the air also has a definite vapor pressure. This vapor pressure varies as the moisture content (grains per pound) and with the dew point of air. For this reason either one of these three expressions, moisture content, dew point or vapor pressure may be used to describe a given condition of air. In this paper the term dew point is used wherever possible.

The vapor pressure in air, in water or in hygroscopic substances is the deciding factor which will cause moisture to be transferred from one to another. The following physical laws should be noted:

(a) Water vapor always tends to flow from a zone of high vapor pressure to a zone of low pressure until it has been equalized in both zones.

(b) Water vapor can be transferred from a zone of high vapor pressure to a zone of low vapor pressure in several ways—by evaporation from water or ice into air, by condensation from air into water, by ab- or adsorption from air into solid materials, by evaporation from solid materials into air and by diffusion from one solid material to another and from one air zone to another.

All of these processes can take place very slowly or very rapidly and their speed depends entirely on the existing temperatures, the difference in vapor pressure between the two zones, the contact surface and the velocity of the air.

It follows from these facts that air which is in contact with free moisture, as it is defined above, will always tend to become saturated with water vapor. Once the air is saturated with water vapor, the vapor pressure in water and in the air have become equalized and no more water can evaporate, no matter how rapidly the air may circulate over the surface of the water.

(3) The absorption of hygroscopic moisture. Hygroscopic substances normally have the noteworthy property of having a lower vapor pressure than free water at the same temperature. Consequently a pressure gradient exists which forces water vapor into the hygroscopic material. For instance, a piece of completely dry lumber of normal temperature has practically no vapor pressure, corresponding to a dew point many degrees below freezing temperature. Consequently, when this piece of lumber is brought in contact with moist air, the difference of the vapor pressure between the moist air and the dry lumber is so great that vapor from the air will rapidly flow over to the lumber. This process is called "absorption of moisture." As a result, the dew point of the air and its relative humidity will be reduced and at the same time the vapor

Deck Officers' Licenses

The following list shows licenses granted during the month of October to deck officers of the merchant marine at Pacific Coast offices of the Bureau of Marine Inspection and Navigation:

Name and Grade	Class	Condition
SEATTLE		
Dudley A. Durrant, Chief Mate	OSS, any GT	RG
Douglas W. Asquith, 2nd Mate	OSS, any GT	RG
Philip W. Corser, 2nd Mate	OSS, any GT	RG
Clyde N. Andrews, 3rd Mate	OSS, any GT	O
William N. Sims, 3rd Mate	OSS, any GT	O
JUNEAU		
Jack L. Hall, 2nd Mate	OSS-OMS, any GT	O
SAN FRANCISCO		
Harry H. Dreany, Master	OSS, any GT	RG
Emery C. Larsen, Master	OSS, any GT	RG
Rene A. Chesselet, Chief Mate	OSS, any GT	RG
Benjamin M. Perkins, Chief Mate	OSS, any GT	RG
Jens M. Stangland, 2nd Mate	OSS, any GT	RG
Robert F. Hanks, 2nd Mate	OSS, any GT	O
William H. Chilcoat III, 3rd Mate	OSS, any GT	O
Warren R. Gresham, 3rd Mate	OSS, any GT	O
SAN PEDRO		
Hedley G. Hansen, Master	OSS, any GT	RG
Oiva V. Koski, Master	OSS, any GT	RG
Adolf P. E. Kirtz, Chief Mate	OSS, any GT	RG
Harold E. J. Shell, 3rd Mate	OSS, any GT	O

Abbreviations: GT is gross tonnage; RG is raised grade; O is original license; OSS is ocean steamer; OMS is ocean motorship.

pressure and moisture content of the lumber will be increased.

By absorbing moisture the vapor pressure of the originally dry piece of lumber increases rapidly. Lumber of 70 degrees temperature and 2 per cent moisture content has a vapor pressure corresponding to a dew point of 52 degrees. With increasing moisture content in the lumber, its vapor pressure rises and approaches the one of free water of the same temperature. At the so-called "fibre saturation point" lumber and free water have the same vapor pressure. The fibre saturation point of lumber is at about 31 per cent moisture content. It can be obtained by keeping lumber in saturated air long enough.

(4) The Evaporation of Hygroscopic Moisture. A piece of lumber of 70 degrees temperature and 20 per cent moisture content has a vapor pressure equal to a dew point of 65 degrees. When this piece of lumber is brought in contact with air of a dew point less than 65 degrees, the vapor pressure in the lumber will be higher than in the air. Consequently moisture will evaporate from the lumber until the vapor pressure in the air and lumber have become the same. As moisture evaporates from the lumber, its vapor pressure drops and consequently the lumber will not dry out entirely when ventilated with unsaturated air, but will obtain a certain definite moisture content, which corresponds to a definite condition of the contacting air. This moisture content is called the "equilibrium moisture content" for a given air condition.

(To be continued)

Engineers' Licenses

The following list shows the licenses granted during the month of October to engineer officers of the merchant marine at Pacific Coast offices of the Bureau of Marine Inspection and Navigation:

Name and Grade	Class	Condition
SEATTLE		
Charles J. Byrne, Chief Eng.	OMS, any GT	O
Bert A. Johnson, Chief Eng.	OMS, any GT	O
John R. Parfit, Chief Eng.	OMS, any GT	O
JUNEAU		
Maxwell J. Short, 2nd Asst. Eng.	OSS, any GT	O
PORTLAND		
Bennie A. Johnson, Chief Eng.	OSS, any GT	RG
Carl A. Green, 1st Asst. Eng.	OSS, any GT	RG
Jerry W. Jones, 2nd Asst. Eng.	OSS, any GT	O
SAN FRANCISCO		
Johannes Paulsen, Chief Eng.	OSS, any GT	RG
Walter W. Scott, Chief Eng.	OSS, any GT	RG
Frank McDaniel, 1st Asst. Eng.	OSS, any GT	RG
Swen E. Westling, 1st Asst. Eng.	OSS, any GT	RG
George E. Edwards, 1st Asst. Eng.	OSS, any GT	RG
Albert Suddjian, 1st Asst. Eng.	OSS, any GT	RG
Charles L. Lowder, 2nd Asst. Eng.	OSS, any GT	O
Adolph Johannessen, 2nd Asst. Eng.	OSS, any GT	O
Louis J. Abberman, 2nd Asst. Eng.	OSS, any GT	O
Samuel D. Kendrick, 2nd Asst. Eng.	OSS, any GT	O
Erwin G. Hay, 2nd Asst. Eng.	OSS, any GT	RG
Donald M. Smith, 2nd Asst. Eng.	OSS, any GT	RG
John A. Halvig, 2nd Asst. Eng.	OSS, any GT	RG
Otto K. H. Boltz, 2nd Asst. Eng.	OSS, any GT	RG
Wilfred E. Imeson, 2nd Asst. Eng.	OSS, any GT	RG
Thomas W. Harris, 3rd Asst. Eng.	OSS, any GT	O
John S. Burtis, 3rd Asst. Eng.	OSS, any GT	O
James F. Irvine, 3rd Asst. Eng.	OSS, any GT	O
Alan W. Logan, Chief Eng.	OMS, any GT	RG
Wainel S. Bratt, 3rd Asst. Eng.	OMS, any GT	O
SAN PEDRO		
Carl G. Halseth, Chief Eng.	OSS, any GT	RG
Elmer J. Huebenbecker, Chief Eng.	OSS, any GT	RG
James J. Cheetham, 1st Asst. Eng.	OSS, any GT	RG
Maurice Smith, 1st Asst. Eng.	OSS, any GT	RG

Abbreviations: GT is gross tonnage; RG is raised grade; O is original license; OSS is ocean steamer; OMS is ocean motorship.

EVOLUTION OF MARINE FURNACES

(Continued from Page 29)

complete water cooling of the furnaces.

The specifications call for an exceptionally efficient power plant on an overall basis and it is essential that the steam generating units be unsurpassed in economy of fuel. This involves high heat transfer rates and the maintenance of clean surfaces. No less than fourteen soot blowers of the most modern pattern are applied to each of the steam generators. Mechanical draft will be supplied by forced draft fans blowing air for the burners through a casing around both ends and bottom of the furnace, thus providing a cool casing and cool fire room.

Design operating conditions contemplate propelling a 9300 deadweight ton vessel at a sea speed of 15½ knots on a total fuel consumption of 0.62 lb. of oil per shaft horsepower for all purposes. The design anticipates 6000 shaft horsepower from the two boilers, delivering steam at 450 lb. per sq. in. pressure and 750 deg. F.

● **No Contest**

"This butter," said boarder number one at the breakfast table, "is so strong it could walk over and cuss the coffee."

"It wouldn't do any good," said boarder number two. "The coffee is too weak to talk back."

Rubber In Ship Construction

By HERBERT CHRISTOPHERSEN
Development Engineer, Raybestos-Manhattan, Inc.

Today it is possible to bind rubber to metal with a bond that is equal in strength to the rubber itself. This new development has opened a field of application for rubber products which is especially applicable to the marine field.

For all practical purposes, rubber is waterproof, corrosion resistant, and flexible. Rubber is not affected by reasonable changes in temperature. It is one of the best electrical insulators, and today, with the advent of newer rubber chemicals such as accelerators and anti-oxidants, it can be made more durable and more resistant to wear, heat, and ageing, than ever before. Within the past few years synthetic rubbers of one kind or another have been developed and commercialized, which have unusually good oil-resistant properties, giving a material having most all the desirable properties of rubber, without its great deficiency of poor resistance to oil.

In ship construction rubber has a number of uses. Some are entirely new applications; others are modern adaptations of previous uses. Rubber is now being used as a protective covering for shafts exposed to the action of sea water, as a protective lining for salt-water piping, as a protective covering or lining for steel surfaces subjected to the corrosive action of sea water, as vibration and noise dampeners, as oil-resistant gasket material, and also as a bearing material in strut and stern-tube bearings.

● Rubber as a Protective Covering for Shafts

As applied to shafts exposed to the action of salt water, rubber offers a protection to the steel shafts against corrosion and erosion to a degree which has been impossible to obtain in the past. By the use of rubber protective casings in conjunction with the conventional bronze bearing liner, the bronze liner need be only sufficiently long to give the proper bearing area and, thereby, a more efficient shrink-fit to the steel shaft can be obtained than with a combination bronze bearing and protective liner.

Rubber is an ideal material for shaft covering, having sufficient resiliency and flexibility to adjust itself to any twisting or bending of the shaft without in any way affecting its bond to the shaft or its anchorage to the bronze bearing liners. Rubber has a toughness which will resist damage due to handling, and, due to the excellent bond which can be obtained between rubber and steel, the possibility of damage when installing or drawing the shaft is very remote. The conditions under which a rubber protective casing is used are ideal insofar as the rubber itself is concerned, because the shaft is under water and therefore is protected against the action of the sunlight and atmosphere. This, of course, is particularly true in the case of fully housed shafts, such as is common practice in modern ships.

Rubber protective casings offer a considerable saving in cost and weight over the bronze protective liners. The saving in cost may be as high as 25 per cent, and the reduction in weight from 5 to 20 per cent of the complete shaft, depending on the diameter and length of the rubber protective casing.

● Rubber-Lined Salt-Water Systems

An ever present source of expense and trouble in all types of ships is the salt-water piping, such as fire mains, sanitary and bilge lines, etc. Salt water, in itself, is highly corrosive to steel and to practically all alloys that are used in the marine field. Such corrosive action is greatly accentuated wherever galvanic action is present. This occurs in modern ship construction, where many dissimilar metals, forming parts of the salt-water system, come in contact, and galvanic action can hardly be avoided. In addition to the galvanic action set up by the contacts of dissimilar metals, there are stray electrical currents, caused by the electrical equipment. In recent years, great difficulty has been experienced with the failure of the salt-water pipe systems after short periods of service, because it is practically impossible to eliminate galvanic action due to electrical currents of one kind or another. A remedy for salt-water piping troubles is the use of rubber, which is absolutely resistant to any type of salt-water corrosion. Rubber, being a good electrical insulator, breaks up or prevents the generation and flow of electrical currents from any source, so that rubber-lined pipe not only is highly resistant to all corrosive action but gives considerable protection to connecting equipment, which is not rubber lined, simply by preventing the occurrence of galvanic action.

The use of rubber in the marine field for the protection of salt-water pipes against corrosion is a relatively new application; the first installations were made approximately four years ago. Rubber has been used for years as a protective lining for pipe lines and tanks in industry for the storage of the most corrosive chemicals, such as hydrochloric acid. The author is familiar with installations of rubber-lined tanks, pipes and fittings for handling acid, which have been in daily use for the past 25 years and which are apparently in as good condition as the day they were installed. The initial cost of rubber-lined pipe is greater than that of unlined pipe, but this is offset by the fact that, barring accidents or alterations, a rubber-lined pipe system should give trouble-free service for the life of the ship, and the maintenance cost should be nil. Rubber lining permits of the thinnest walled pipe consistent with proper working strength, and thus affords considerable saving in weight over the heavy-walled pipes now used to allow for corrosion.

Rubber-lined pipes are practicable on all salt-water systems where the constant working temperature does not exceed 180 degrees F. Rubber-lined pipe can be furnished in sizes from 1¼ inches in diameter to the largest size required, and in lengths up to 24 feet. Also all types of fittings are available. It is practicable to rubber line many intricate shaped pipes and fittings.

Rubber is a material which is soft and plastic in the uncured or green state: when properly cured it becomes hard and horn-like, giving a coating which is especially corrosion-resistant, and an excellent electrical insulator. Consequently, sections of rubber-lined pipe can readily be tested as to their homogeneity and resistance to chemicals, moisture or electricity, by a simple electrical test, made by touching one electrode of the transformer to the casing of the pipe and moving a feeler plate lightly over the rubber surface of the lining. Any weakness of even the most minute kind, such as fine pin-holes, air blisters, etc., will immediately make itself known by an electrical discharge. This method of testing also makes it possible to find thin spots in the lining, because these thin spots cannot offer sufficient resistance against the electric potential. The author knows of no other method of lining pipe in which it is possible to test for perfection in the lining coating so positively as it is with rubber-lined pipe.

Tests have been made on rubber-lined pipe to determine its resistance to marine growth. While the test did not show that the rubber lining was superior to other materials, it did prove conclusively that it was in no way inferior to other materials now being used for salt-water systems. As rubber-lined pipe is absolutely resistant to corrosion, it is possible to add certain chemicals to the salt water flowing through the pipes, which would absolutely prevent any growth of marine life, without harm to the salt-water system.

● Protective Rubber Covering for Steel Surfaces

There are many places on board ship, other than those mentioned, where rubber-on-metal can be used to advantage; for example, as a protective lining in the water chambers of condensers, as well as on the tube sheets; also as a lining for the condenser intakes, or as a lining in the hotwell, provided the constant temperature of 180 degrees is not exceeded. It can be used to advantage as a lining or protective covering between the metal tank and the tile in swimming pools. This rubber covering can also be used as both a protective and a decorative finish for the swimming pool, in which case the tile could be dispensed with.

A recent application of rubber in ship construction has been the vulcanization of rubber matting with a special tread directly to the steel decks of ships, where a non-skid surface was required. This matting is exposed to the most difficult of conditions. It is constantly subjected to the elements, as well as salt-water spray, and, at times, to solid seas. Reports to date have shown that this matting is functioning satisfactorily after several years' service. It is to be expected that its life and service will justify its continued and more general use in ship construction.

● Vibration and Noise Dampeners

In the past few years great strides have been made in the automobile industries in the application of rubber as a sound and vibration dampening medium. The most familiar application is the so-called floating-power, wherein the engine is mounted with rubber supports between the engine and the chassis. There are many places aboard ship where this same principle can be used to advantage, especially on the newer and faster ships where the reduction of vibration and noise is an acute problem. There is a great need for vibration and noise dampeners in connection with ventilating and blower systems, as well as on the smaller auxiliary units, such as pumps, motor generator sets, radio units, etc.

● Oil-Proof Gaskets

Rubber has been used as gasket material aboard ship for many years, but its scope of usefulness has been drastically limited because it could not be used wherever it came in contact with oil. Within the past few years, great strides have been made in developing synthetic rubbers, which have the unusual characteristic that, while they retain enough of the resilience and elastic qualities of rubber to make them most suitable for gaskets, they also have good oil resistance. Gaskets made from these synthetic rubbers are now available for all types of hatch gaskets, where in the past the conventional type of jute or flax packing has been used for the want of a better material.

These oil-resistant synthetic rubber gaskets can be made in complete units to fit even the largest hatches on the modern tankers, as well as gaskets for manholes of fuel tanks. These new oil-resistant synthetic rubbers have many advantages over the old rubber packing, not only in their greater oil-resistance but also because they are much more resistant to weathering and sun-checking, and can be expected to give long service.

● Rubber Bearings

When wet, rubber is very slippery and this particular property has been used for many years in rubber bearings for motor boats. Rubber is not only slippery when wet but is yielding and allows gritty, hard material to roll across its surface instead of becoming imbedded in it, thus saving the shaft from scoring. The low co-efficient of friction of wet rubber, and its property of shedding grit, make it ideal for bearing material. When used in shallow waters where considerable sand is present, rubber bearings will out-wear the conventional bearings 4 to 1. These rubber bearings have been used for years on small boats, dredges, etc., where the cutting action of the sand has been a serious problem. In recent years, with the improvements in rubber compounds and the design of bearings, these bearings have been adapted for use on larger vessels until today the rubber bearing is suitable for the largest vessels afloat. As long as it is kept wet, it will outwear any conventional bearing.

(Paper presented to the General Meeting of the Society of Naval Architects and Marine Engineers at New York, Dec. 2, 1938.)

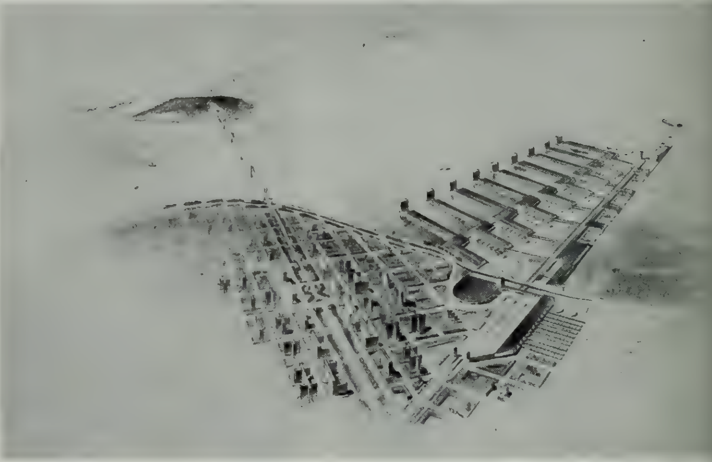
San Francisco In 1999

A Stainless Dream In Ferrous Alloys

The possibilities of engineering and city planning 60 years hence will be displayed by United States Steel Corporation at the Golden Gate International Exposition of 1939 at San Francisco.

A major feature announced for the corporation's exhibit will be a large prophetic working diorama showing how the city of San Francisco might appear in the year of 1999 if a careful program of city planning was adhered to during the next 60 years.

While the plan is idealistic and farseeing, it is capable of actual fulfillment, according to Walter Dorwin Teague, designer of the steel exhibit. The plan could be accomplished over a long period without razing existing structures before their normal obsolescence and without interrupting the city's normal functions.



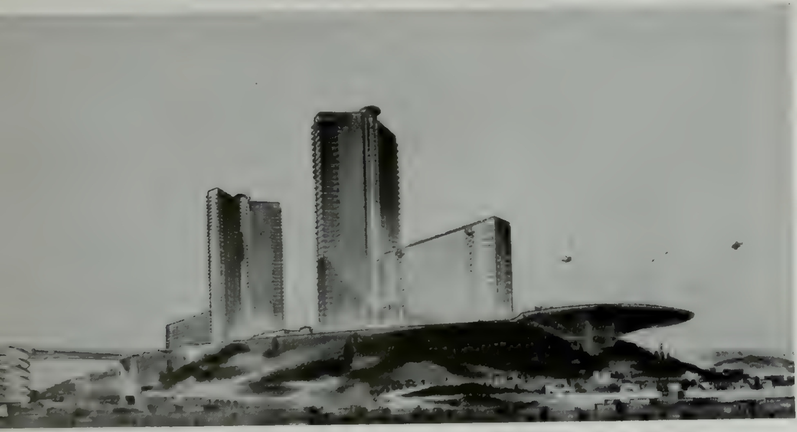
In designer Teague's conception of San Francisco in 1999, the present waterfront of the city will have become a broad, parked esplanade and boulevard. All docks and ships will be centralized at one huge pier, which will be a combination water-air-highway and rail terminal affording 12 miles of dockage and four million feet of storage space.

In the diorama the existing layout of the city has been retained, with many of the major thoroughfares remaining to become the broad boulevards of 1999.

Designers of the exhibit have found the present acute traffic problem in San Francisco is due in large part to the scattered and disorganized terminal facilities for the various types of transportation. This situation has been corrected in the new plan. At the foot of 16th Street is a huge terminal and pier serving all transport lines — railroads, shipping, planes, buses and trucks.

The pier itself affords 12 miles of wharf space and four million feet of storage space. Improved and highly efficient methods of loading and unloading makes further dockage facilities unnecessary, so the existing waterfront has been replaced with a landscaped shore drive connecting the city's two bridges.

The complete solution of the traffic problem, in the plan, holds these additional features: The widening of remaining streets, the creation of clover-leaf intersections at points of heavy traffic convergence, an elevated highway which connects the hilltop communities and forms a bypass around the business section, a shore drive connecting the bridges and encircling the city, parking areas under the business buildings



San Francisco's Telegraph Hill as it will appear in 1999, according to the designs of Walter Dorwin Teague, designer of the U. S. Steel Corporation exhibit at the Golden Gate International Exhibition at Treasure Island, San Francisco Bay, in 1939.

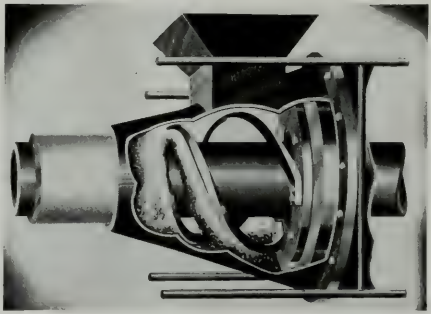
and subway lines instead of surface cars.

In the commercial area are found super blocks 550 feet by 800 feet; each block would have one skyscraper 30 stories in height. The remaining area of the block would be devoted to one-story shops and landscaping.

An outstanding feature of the residential section is the seven hilltop communities located on the crest of the city's seven hills. In the plan of the future all existing structures on the slopes of the hills will be cleared and these areas transformed into protective green belts. On their tops are 20, 30 and 40-story apartment houses disposed to insure maximum light and view. Each hilltop community would house from 5,000 to 20,000 people and each has its community of shops, schools, landing field and parking areas. A wide elevated highway connects the city's seven hilltops, with double spiral ramps giving access to the lower levels. One spiral will be used for ascending traffic and the other for descending, while the center is occupied by a multi-storied garage. The garage may be entered at any level by cars from either spiral.

Numerous other advantages are contained in the plan, including the use of steel in low cost housing projects and in apartment houses throughout the residential area.

Permanent Protection For Pipe Lines



Armor-clad, a new process of coating pipe with cement or bituminous concrete, has recently been introduced by the American Pipe & Steel Corporation. This unique method of application, by means of a specially designed, patented machine, now makes it possible to obtain a continuous, dense, uniform outer jacket which forms a perfect, seamless bond with the pipe. This type of protective covering is intended to be permanently effective.

Armor-Clad is based on the theory that any properly prepared material can be made to adhere tightly to pipe if it is submitted to continuous rubbing pressure. However, such plastic materials must be of the proper consistency, similar to that of bituminous and concrete Armor-Clad formulas, to respond to the spiral rubbing, troweling, and tamping action that is the secret of the success of the process. Coatings, after having been submitted to tremendous pressure, are held firmly in position by atmospheric pressure because of the intimate contact of steel and plastic.

Subjected to severe tests under the worst possible conditions, Armor-Clad has proved to be strong and durable; impervious to the destructive forces of corrosion, electrolysis, abrasion and soil stresses. In one case, a pipe that had 20% of its area completely rusted away was rehabilitated and made serviceable; its newly acquired mechanical strength supplied by massive concrete enabled it to successfully withstand pressures as high as 90 pounds.

One of the most unusual and vitally important factors that contribute to Armor-Clad's economy of application is that pipe lines can be coated in the trench without interruption of service in any way. The light steel construction of the machine facilitates its being taken into any territory, no matter how difficult the terrain. It is adjustable to various sizes of pipe and can apply coatings of thicknesses ranging from ⅝ inches to 2 inches. Easy removal of parts provides for the passing of obstructions and joints.

This process incorporates many potential advantages and savings which establish it as a most important forward step in the everlasting fight to control ravaging natural forces. Although plastics have been known that would prevent corrosion with some degree of success, methods of applying them have been far too costly to be practicable. Every pipe line operator who has worried through years of heavy expenditure for maintenance purposes knows that profits have suffered proportionately.

Literature of the Industry

Control of Ocean Freight Rates in Foreign Trade, by Albert E. Sanderson, Transportation Division, Department of Commerce; 166 pages with numerous tables and diagrams, bound in paper, and obtainable at any office of the Bureau of Foreign and Domestic Commerce; 20 cents net.

This study indicates the adverse effect of excess of tonnage over requirements by index numbers of world charter rates as compiled by the Chamber of Shipping of the United Kingdom. These show that the general level of these rates in 1929 was only slightly higher than in 1913. From a base of 100 as of 1929 the index numbers show a decline to 75 in 1935, a rise to 84 in 1936, and a further rise to 131 in 1937, during which year the shipping industry was favored with an exceptional volume of business. By April, 1938, however, the index had declined to 95.

The book just made available deals with the more fundamental aspects of rate control as well as with measures which have been adopted for the prevention of discriminations and unfair practices in all the principal shipping countries.

New York's Latest Fireboat

A Diesel-Electric Floating Power House Equipped With the Most Modern Apparatus for Fighting Fire

Fire Fighter, one of the most powerful fireboats in the world, has undergone tests satisfactory to the Fire Department of the City of New York, and has been delivered to that body by her builders, the Staten Island, New York, yard of the Bethlehem Shipbuilding Corporation, Ltd. Her architects were Gibbs & Cox, Inc. Her contract cost was $924,000. Her principal characteristics are:

Length, O.A.	134 ft. 0 in.
Length, W.L.	131 ft. 0 in.
Beam	32 ft. 0 in.
Depth	13 ft. 3 in.
Sheer	3 ft. 6 in.
Draft	9 ft. 3 in.
Displacement	583 tons
Power for propulsion	2,000 hp.
Speed	17.02 m.p.h.
Pumping capacity	20,000 g.p.m.
Power for pumping	1,600 h.p.

In preliminary tests Fire Fighter did better than her official rating of 20,000 gallons per minute at 150 pounds per square inch pressure at the nozzle.

Diesel-electric Fire Fighter on propulsion trials.

● Propulsion Machinery

Designed and built by General Motors especially for this job, the main power units are two diesel-generator sets, each consisting of a 16-cylinder, 8½-inch by 10½-inch Vee type, 2 cycle General Motors diesel engine rated 1,500 B.H.P. at 750 r.p.m. and driving three Westinghouse Electric and Manufacturing Company generators on one shaft.

Diesel-electric Fire Fighter in action.

One generator is of 900 K.W. capacity at 600 volts, the second of 170 K.W. capacity at 450 volts. The third is a 40-K.W., 120-volt exciter.

Power for propulsion is supplied by two Westinghouse motors of 1,000 H.P. each at 450 r.p.m. Each is direct connected to its propeller shaft. The speed is controlled by varying the shunt fields from the control station in the pilot house or in the engine room.

The entire deck house is given over to machinery and fire fighting equipment, except for a toilet in the forward section and a locker room in the aft section. The forward section of the deck house contains a nozzle room, abaft of which is a foamite and CO_2 room. The after section forms a part of the machinery space, and is occupied by the intake and exhaust silencers, boiler, day tanks, water heater, ventilating blower and auxiliary compressor.

● Fire Pumps

The four fire pumps are of the two-stage centrifugal type, each being driven by a Westinghouse 400-H.P. motor at 1,500 r.p.m., and having a capacity of 5,000 g.p.m.

against 150 lbs. pressure, or a total of 20,000 g.p.m. when operated in parallel.

The two pumps on each side can be operated in series when higher pressure is desired, giving a total capacity for the four pumps of 10,000 g.p.m. against 300 lbs. pressure.

The method of power distribution for the main units is such that for normal propulsion the 900-K.W. shunt-wound generator of the port engine supplies current to the port propelling motor, while the one on the starboard engine serves the motor on that side.

Each main generator is switched to two fire pumps when pumping is started, while the 170-K.W. generators operate the propulsion motors with enough power for maneuvering and for holding the boat in position against the thrust of the monitors. These 170-K.W. generators also supply the 50-H.P. air compressor motor.

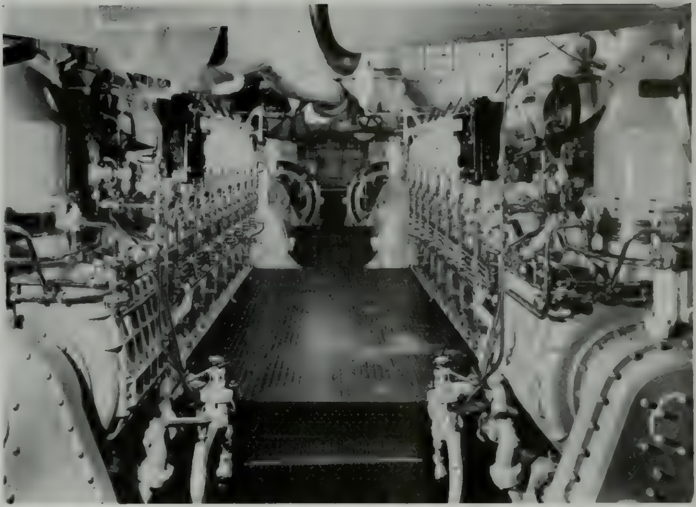
The 40-K.W. generator on each engine is a constant voltage, variable speed unit, used for supplying excitation and auxiliary power.

Each pair of fire pumps is brought up to speed by varying the generator shunt field, after which each individual motor is controlled by its own shunt field rheostat. These rheostats may be connected by clutches for simultaneous regulation.

The four fire pumps all draw water from a common cross-connection suction manifold 27 in. in diameter, with suction valves so arranged that the pumps can draw from either side or the center. An additional suction connection 8 in. in diameter permits water to be drawn from the bilge.

The pumps discharge into a 14-in. discharge line which connects to all the outlets. These include two hose manifolds on each side of the deck house, with twelve 3½-in. outlets on each side. To guard against freezing, these manifolds are enclosed within heated housings, with only the valve stems and wheels exposed.

In addition to the hose manifolds there are eight monitors, one of 6,500 g.p.m. capacity, five of 3,000 gal. and two of 2,000 gal. For the protection of boat and crew when fighting fire at close quarters, the deck house is encircled by perforated piping by means of which a screen of water can be laid down.



Fire Fighter's engine room, looking aft between the two General Motors 1500 B.H.P. diesel engines.

Each of the main generator engines is a self-contained unit, with attached auxiliaries that include a lube-oil pump, fresh water circulating pump, salt water circulating pump, water cooler, oil cooler, lube-oil filter and fuel-oil strainer.

To insure the engines being always ready for an instant start, every precaution is taken. When the engines are not running the cylinders are kept warm by water at 100 degrees continuously circulating through the jackets by means of a 25 g.p.m. pump discharging through a steam heater.

Warm oil from an electric heater is circulated through the lubricating system. If the starting air should be lost, the engines may be started by current from a storage battery, using the generators as motors.

● Auxiliary Power

Auxiliary power is furnished by two General Motors Diesel-generator sets, one of 40 K.W. and the other of 10 K.W. capacity. When the main engines are running these are not needed, as the exciters can be connected to the auxiliary power busses. Power may be taken from shore lines when desired, by means of a 10-K.W. motor generator.

Two tanks, each 2 ft. by 8 ft., are used for storing starting air. A third tank of the same size is charged through a reducing valve with air at 100 lbs. pressure for the whistle.

Air is supplied to these tanks by a two-stage, motor-driven compressor of 40-c.f.m. capacity. For the operation of paving breakers and similar equipment, a separate air system is provided, supplied by a tank 18 in. by 72 in., which is charged to 100 lb. pressure by its own 230-c.f.m. compressor driven by a 50-H.P. motor.

Two boilers are provided, each fitted with automatic oil burners. The first, which is used for supplying steam heat to quarters, heating fresh water, and supplying steam to thawing hose, is of the Scotch cylindrical fire tube type, with capacity for 3,500 sq. ft of radiation.

The second is a smaller unit, to be used for heating fresh water in summer and supplying hot water for the engine jackets.

Air blown over copper radiators furnishes heating throughout the boat. The radiators drain to a condensate tank in the engine room, whence the condensate is taken by an automatic pump.

• Ventilating System

An elaborate ventilation system is combined with the heating system for engine room and quarters arranged for protection of the crew when working in same or gas-laden air. The system can be operated in three ways:

1. All air may be passed through coolers, discharged to spaces to be ventilated and exhausted naturally;

2. All air may be taken from the spaces and recirculated, without the admission of exterior air;

3. The air can be recirculated, with some air exhausted and an amount added from outside equal to the amount exhausted. The air is passed through tubular cooler through which salt air is circulated. When required, oxygen can be added to the air from two 50-lb. oxygen bottles in the engine room.

A separate system, with a capacity of 5,600 c.f.m., supplies air for cooling the main generators. Inlet air for the diesel engines is taken from an air space in the superstructure above the deck house, the inlet louvers being baffled to prevent entry of water.

• Fuel Oil System

Each engine is self-contained, and is provided with all equipment necessary for complete operation, including attached lubricating oil pumps, attached fresh water circulating pump for jacket cooling and attached salt water pump for circulating fresh water cooler, lubricating oil cooler, expansion tanks, lubricating oil filters and lubricating oil suction and discharge tank, fuel oil strainers, exhaust mufflers, pyrometers, gages, thermometers and thermocouples.

Fuel oil is carried in tanks having a capacity of about 7,000 gal. From the tanks it is passed to centrifuges in the engine room for cleaning, the clean oil being discharged to a 725-gal. clean oil tank under each engine, whence it is drawn by the engine fuel pumps.

Sludge from the centrifuges is discharged to a 25-gal. tank. Fuel for the boilers is carried in a 93-gal. tank in the superstructure.

Abaft the funnel, on the boat deck is a monitor tower 36 feet long, which elevates in the fore-and-aft direction. It is operated hydraulically, in the same manner as the land towers, with hand gear for emergency use. The tower carries a 3,000 g.p.m. monitor nozzle that may be rotated horizontally.

In addition to the water system, the boat carries four portable foam-generators, each having a capacity of 500 gallons of foam per minute at 100 lbs. pressure, and a CO_2 system with remote control for engine room protection.

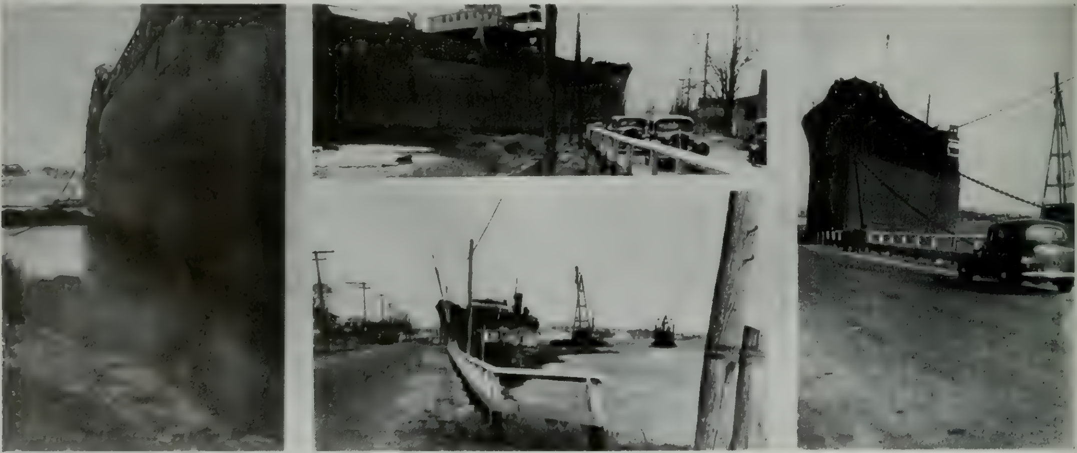
A Tanker's Inland Voyage

On September 21, 1938, when the great hurricane struck Boston, the tanker Phoenix was anchored in Fall River opposite the Shell Oil terminal. This ship is owned by the American Tankers Corporation. She is of 8,974 deadweight tons and has a cargo carrying capacity of 77,024 barrels of oil in cylindrical tanks. She is 401 feet long, 54 feet beam and 32 feet 9 inches molded depth. At the time she was loaded with gasoline.

The hurricane drove her upstream, dragging her anchors. In the course of several miles of driving in this way, she went through a house and garage and finally came to rest with her stern on a stone jetty and her bow on the bank of a highway, leaving her midship portion unsupported.

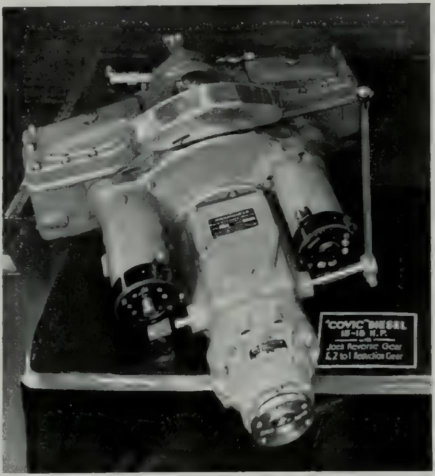
A salvage firm have shored her up amidships to prevent sagging and twisting of the hull and are dredging a channel alongside into which they will launch her sideways and then pull her to deep water.

For this information and the illustrations we are indebted to a subscriber, George A. Bishop, Jr., of Fall River, Mass.



These photos taken by George A. Bishop, Jr., of Fall River, Mass., illustrate what a hurricane can do to large vessels when it really gets down to the business of moving things around.

Covic Diesel Expansion



The Covic Diesel — marine type.

National distribution for Covic Diesel engines is being rapidly completed by the Northill Company, Inc., Los Angeles manufacturers, through a series of dealer demonstration meetings in all parts of the country, followed by the appointment of distributor and dealer organizations.

Regional managers for the Covic Diesel division of the Northill Company were named in October in several territories. R. K. Johnson and David Bennett will make headquarters at 90 Pine Street, New York City, and jointly handle the Atlantic Coast north of Norfolk, Va. J. E. Oliphant will work from Marion, Ohio, to serve Ohio, Kentucky, Tennessee and West Virginia. Louis Swenson will have headquarters in Chicago for the territory from that city to St. Louis.

Distributors named for the New England and North Atlantic territories include Warren Norge Company, Inc., of New York City; Banthin Body Company, Inc., Bridgeport, Conn.; Larson Marine Company, Boston, Mass.; Bazzaro Engineering Company, Washington, D. C.; and Sol Brancato & George Levine, New Haven, Conn. Announcement of distributors for the midwest territories and southern states will follow meetings in those districts.

Deliveries of the Covic Diesel engine are now being made to these distributors from the Northill factory.

Of the horizontal opposed cylinder design, the Covic Diesel is a four cycle, valve-in-head type of engine. The engine has a bore of 3-5/32", stroke of 3-15/16", displacement of 61 cu. in. and is rated 15-18 HP.

Total weight of the bare engine, with hand cranking system and 60 pound flywheel, is 280 pounds. Weight of complete marine engine, with electric starter, is 550 pounds; of the automotive engine with four-speed transmission, electric starter and generator, 425 pounds.

Total width is 30", height 19½", length 19".

Marine types include hand starting and complete electrical models for main power in small boats, auxiliaries in sailboats and generating sets.

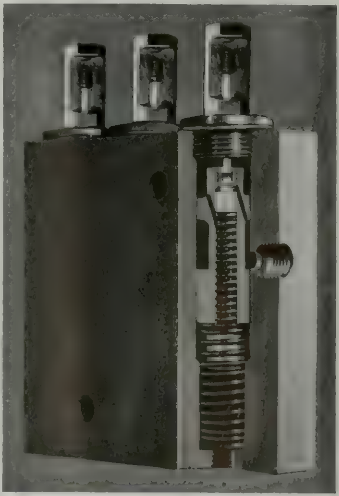
Grease Lubricators for Auxiliary Machinery

Blaw-Knox Company, through its Gordon Lubricators Division, announces a new line of grease lubricating equipment offered to users of cranes and auxiliary equipment. It is known as the Model H Lubricating System, and contains a manually operated pumping unit designed for use with the new Model H measuring valve.

The pump holds eight pounds of grease and can be filled by hand, or by means of a portable grease pump through a fitting provided for that purpose. Double acting pistons, a unique feature for pumps of this type, reduce the time cycle of operation, and a detachable handle is a safety precaution against tampering or excessive operation. Other normal equipment includes a control valve, a grease strainer, and a pressure gage.

The Model H valve operates on a simple displacement principle. The springs used are compared in their action and design to the valve springs used in automobile engines. The line pressure from the pumping unit is utilized in forcing a measured shot of grease into the bearing, and when the pressure is relieved at the pump the valves recharge in readiness for the next greasing cycle. Each valve operates as an independent unit although lubricating blocks may be made up in multiple feed groups of as many as four valves.

This auxiliary equipment system adheres to the Gordon Lubricators' principle of single line operation, which is similar to that of a community water line system, and provides independent operation of all valves in parallel. While centrally motivated, each valve is adjustable as to quantity of grease, being capable of feeding from 0 to 0.4 ounce per shot. Economy from an installation standpoint is claimed because of the combination of single line piping and multiple feed mounting, and the individual adjustments are designed to provide operating economy. The illustration shows a three-valve block, cut away to reveal the internal construction of one valve chamber.



Pacific Northwest Notes

Hylebos Turning Basin

A major harbor betterment which will be welcomed enthusiastically by vessels engaged in the salt trade between San Francisco Bay and Tacoma, to supply the two big electrochemical companies operating at the Puget Sound port, is the improvement of Hylebos Waterway. This long channel is the most easterly of 6 that extend into the tidelands from Commencement Bay (Tacoma Harbor), and serves numerous industrial and oil company docks. U. S. Engineers, after extensive surveys based on building a wide-span bridge over the waterway at East 11th St., decided to approve the construction of a large turning basin in front of the Pennsylvania Salt Mfg. Co. plant, at the head of the waterway, so ocean liners would not have to spend a half day backing out of the long channel. The dredge Washington No. 2 began work Nov. 1 and will remove 645,000 cubic yards of silt to form a turning basin 1400 x 510 feet in size. Completion will be early in January, in time for the spring movement of bulk raw salt from the San Francisco Bay salt works. Waste material will create almost a square mile of improved industrial lands. The new 11th St. lift span will be completed by the joint efforts of Tacoma, Pierce County and the State of Washington, and will be ready for traffic by next summer. These improvements will give the largest freighters ample navigating room throughout the entire length of the waterway. Total cost of bridge and turning basin will be in excess of $400,000.

Historic Steamers Scrapped

Late in October, five of the most famous Puget Sound passenger steamers were sold "down the river" for scrap, terminating one of the most stirring chapters in Pacific Coast inland navigation. Bowing to the diesel ferry lines that have come to replace practically every one of the once huge fleet of Sound coasting steamers, these 5 ships have long gathered rust at the Lake Washington docks of the Lake Washington Shipyards, Seattle, and the West Seattle mooring of the Puget Sound Navigation Company. These vessels have been sold by PSN to the Seattle Iron and Metals Corp. for scrap.

This fleet of steamers is estimated to have carried more than 8,000,000 passengers in its lifetime.

They are: the Tacoma, 209.4 ft. x 30 x 17 ft. overall, built by the Seattle Construction and Drydock Company in 1913; the Indianapolis, 177.6 x 32 x 12.3 ft., built by the Craig Shipbuilding Company at Toledo, Ohio, and hauled around Cape Horn in 1908; the Kulshan, 160.3 x 32 x 20.7 ft., built by the Moran Company in 1910; City of Bremerton, ex Whatcom ex Majestic, 147.4 x 48 x 13.7 ft., built by the Everett Marine Works in 1901; and the City of Angeles, ex City of Long Beach, 124.7 x 34 x 10.2 ft., built by Fulton and Iverson, Los Angeles Harbor, 1906.

The Tacoma and Indianapolis each ran over 1,000,000 miles on the 2-hourly service between Seattle and Tacoma for over 20 years, and were once the fastest and most heavily patronized inland vessels on the Pacific Coast. All of the five except the Tacoma in later years were converted to automobile ferries, the Indianapolis running between Edmonds and Pt. Townsend, the City of Los Angeles in the San Juan Islands and the Kulshan between Seattle and Pt. Angeles and Seattle and Bellingham, and the City of Bremerton between Seattle and Bremerton.

Only the historic and lucky Chippewa, three times rebuilt, and now a fast 2200 H.P. single screw diesel ferry plying between Seattle and Bremerton, remains of this once huge steamer fleet. The other members of the old fleet have been either laid up or converted to ferries. With exception of the City of Bremerton and City of Angeles, the 5 doomed ships are of steel construction. The Tacoma, with her giant 3,500 H.P. 4 cylinder triple expansion steam power was rated as the fastest single screw passenger ship in the United States, often touching 22 knots. Her light hull, however, made it impractical to crowd her much over 18 knots in regular service.

Personalities

Fred H. Marvin, president of the Port of Tacoma Commission, was honored Nov. 5 by the Tacoma Transportation Club, in conjunction with the Propeller Club of Seattle, at an old timers' night banquet in the Winthrop Hotel, Tacoma. Mr. Marvin is an old timer in the Pacific marine business, having started as a steamship agent in 1905. He founded the Merchants Transportation Company and helped organize the fleet of diesel powered inland freighters that began service between Seattle, Tacoma, Everett and Olympia. Honor guests were 9 retired members of the Customs and Immigration Service, **W. A. Fairweather, J. A. Bennett, W. S. Dowie, F. E. King, John Harber, F. P. O'Brien, Walter Wheeler, C. C. Whitehead** and **Alfred Voligny.**

Commander A. M. Sobieralski of the Coast and Geodetic Survey has been named inspector of construction on the new survey ship Surveyor, at Lake Washington Shipyards.

Lt. L. C. Wilder of the Geodetic Survey will supervise construction on the 88 ft. wooden survey ship E. Lester Jones, now building at the Astoria Marine Construction Co., Astoria, Ore. The new little survey ship will have 300 H.P. twin screw diesel power. H. C. Hanson, Seattle, is the naval architect who drafted plans. She will be of heavy wooden construction, treated extensively with Wolman salts to prevent decay.

HOW THEY LICKED STERN TUBE TROUBLE ON THE M. V. CORNEVILLE

A new idea in stern tube lubrication that reduced operating costs and increased efficiency

To engineers, recent reports from the *M. V. Corneville* sound almost too good to be true.

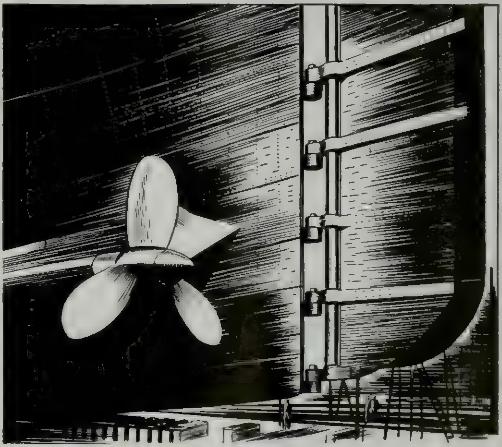
"For'd tube bearings running cooler. No more leakage of water to the after well. Absolutely unnecessary to renew stern gland packing."

Chief Engineer Lars Stenbakken gives Shell's stern tube lubrication method full credit. He writes: "From the day this grease was installed in the tube in February, 1937, mechanical efficiency was increased and replacement expense curtailed."

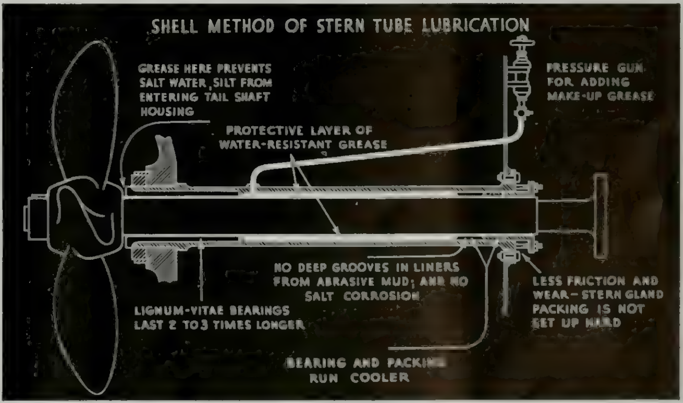
Mr. Stenbakken also says, "When we dock in February, I am confident we'll find no scoring on the shaft liner."

Shell's new method of feeding a water-resistant grease to the stern tube assembly is showing many a ship owner real money savings. Find out today how little it will cost you to adopt this new method. It can be applied in a few hours—without dry-docking.

Phone nearest Shell office, or write Industrial Lubricants Division, Shell Oil Co., Shell Bldg., San Francisco.



NO MORE STERN TUBE LUBRICATION WITH SEA WATER! *A water-resistant grease prevents salt and sand from getting to tail shaft. Friction is lowered, wear is reduced*


SHELL METHOD OF STERN TUBE LUBRICATION
GREASE HERE PREVENTS SALT WATER, SILT FROM ENTERING TAIL SHAFT HOUSING
PRESSURE GUN FOR ADDING MAKE-UP GREASE
PROTECTIVE LAYER OF WATER-RESISTANT GREASE
NO DEEP GROOVES IN LINERS FROM ABRASIVE MUD; AND NO SALT CORROSION
LIGNUM-VITAE BEARINGS LAST 2 TO 3 TIMES LONGER
LESS FRICTION AND WEAR—STERN GLAND PACKING IS NOT SET UP HARD
BEARING AND PACKING RUN COOLER

SHELL MARINE LUBRICANTS

On the Ways—

SHIPS IN THE MAKING

LATEST NEWS FROM AMERICAN SHIPYARDS

Pacific Spruce to Be Converted to Cannery Ship

The Pacific Spruce, well-known Pacific Coast freighter, will be towed from Lake Union, Seattle, to Portland shortly, where the Albina Marine Iron Works of Portland will convert her to a passenger-cannery service ship for the Alaska salmon trade. Her new owners, the Thompson Salmon Company of Astoria, Ore., purchased the 5,509 ton ship from the U. S. Maritime Commission for $55,000. She will be renamed the W. L. Thompson, after the president of the company.

W. C. Nickum & Sons, naval architects of Seattle, have prepared the plans and specifications for rebuilding the vessel, and she will have a capacity of 255,000 cases of canned salmon and 250 cannery workers.

The Albina Iron Works bid $283,000, completion date March 1. Other bidders were: Lake Washington Shipyards, $298,298; Winslow Marine Railway, $309,350; Todd Seattle Drydocks, Inc., $316,595; Lake Union Drydock & Machine Works, Seattle, $318,433; Commercial Iron Works, Portland, $318,627.

Pacific Spruce, formerly West Canon, is a steel vessel of 5509 gross tons. She is 410 feet 6 inches long by 54 feet beam by 27.1 feet depth, is powered with a 2200 indicated horsepower triple expansion engine, and was built in 1920 at the Shaw-Batcher shipyard, South San Francisco, California.

Moore Low Bidder on Vancouver Repairs

Moore Dry Dock Company was low bidder on the work to be done on the Hamburg-American cargo and passenger liner Vancouver. This vessel was badly holed in way of the engine room, and sank in the Oakland estuary, allegedly through bombing from the exterior of the ship. Lowest of three, the Moore bid was $343,000. Of this total $7200 is for hull repairs and $271,000 work on machinery and interiors. The work is expected to be finished in 90 days.

Progress on Survey Vessel

Construction of the new survey ship seems to have been settled in favor of the Lake Washington Shipyards on their bid of $892,000. According to R. M. Van Sant of the Lake Washington Shipyards, work is proceeding rapidly on the new survey ship for the U. S. Coast and Geodetic Survey. She will be 200 x 33 feet, powered with a steam turbine, and will be named Explorer, to replace a wooden vessel of the same name in the same service for the past 34 years. No contract for turbines has been let so far. Keel was laid during November.

CRAIG SHIPBUILDING COMPANY

LONG BEACH, CALIFORNIA

Builders and Repairers of Steel and Wooden Ships

Drydock Capacity 2500 Tons

HULL AND ENGINE REPAIRS

✓ ✓ ✓

FULLY EQUIPPED

FOR

Diesel Engine Work

DRYDOCK — 12,000 TONS CAPACITY

LOS ANGELES SHIPBUILDING & DRYDOCK CORPORATION

SAN PEDRO, CALIFORNIA - - *Cable*: LASHIPCO

● Seattle Shipbuilding Company Low on Dredge Tender

Seattle Shipbuilding Co., a new Northwest yard, submitted the low bid of $115,400 for construction of a new wooden dredge tender for the U. S. Engineers. The new ship will be 84 feet long with a 280 H.P. diesel engine. Lake Washington, Lake Union Drydock, Winslow Marine Railway and Commercial Iron Works all submitted higher bids. Government estimates were $123,704 for the diesel ship and $126,570 for a steam propelled vessel of the same size.

● Fore River Reports Progress

The Fore River Plant of the Bethlehem Shipbuilding Corporation, Ltd., is rapidly pushing work on the many new vessels on its ways and at its outfitting dock.

One large diesel trawler, the Princeton, was launched November 10 and will be delivered December 15. A sister trawler, the Harvard, was delivered November 18. These small ships are 146′ 8″ x 26′ x 14′ 4″. Each is powered with a Cooper Bessemer diesel engine rated 650 shaft horsepower at 260 r.p.m. The special feature of these trawlers is the trawl winch for deep sea trawling. This is motor operated with electric power from a Diehl generator driven by a 140 shaft horsepower Cooper Bessemer diesel. The hull in way of fish holds is lined with cork insulation to the depth of the frames and a complete layer of cork laid over that. The inner lining of the hold is welded nickel clad steel.

Steamer Panama, first of the three passenger and cargo vessels for Panama Railroad Steamship Co., is at the outfitting dock, and the second of these ships will be launched December 10 and christened Ancon. The third vessel, to be christened Cristobal, will be launched during January.

Keel for Hull No. 1474, first of four cargo steamers for the American Export Lines, was laid November 10.

● Standard Gives Westinghouse Million Dollar Order

The sale of nearly a million dollars' worth of propulsion and other marine gear to the Standard Oil Company of New Jersey has been announced by the Westinghouse Electric & Manufacturing Company. This material will be used in the outfitting of a fleet of twelve new twin screw oil tankers embodying National Defense features.

These ships will be notable in their speed—18 knots trial speed when fully loaded. They will be propelled by high pressure steam turbines developing 13,500 shaft horsepower. Each vessel will have an overall length of 551 feet and a cargo capacity of 145,000 barrels.

The United States Maritime Commission is to assume the cost of "National-Defense" features in these tankers. The rest of the cost will be paid by the Standard Oil Company of New Jersey, owner of the ships. The company guarantees to maintain them in service for twenty years, subject to the call of the Government.

Construction work on these tankers will employ about ten thousand workers for a period of about three years in the shipyards of the Bethlehem Shipbuilding Corporation, Ltd., Federal Shipbuilding and Dry Dock Company, the Sun Shipbuilding & Dry Dock Company, and the Newport News Shipbuilding and Dry Dock Company, and will afford employment to thousands of others engaged in affiliated trades and business.

● Sparrows Point to Launch Tanker

Hull No. 4334, the 13,000 deadweight ton tanker of the Bethlehem-Frear type building for the Union Oil Company of California, is to be launched December 10.

● New York Shipbuilding Corp. Gets Large Navy Order

The New York Shipbuilding Corporation of Camden, New Jersey, which has one destroyer tender and one seaplane tender on the ways for U. S. Navy account, received a duplicate order on each of these ships on October 14. The flat unadjustable price on the 8300 ton seaplane tender is $11,249,000, and that for the 9000 ton destroyer tender is $11,947,000. The seaplane tender is to be named Albemarle, and the destroyer tender, Prairie.

(Section continued on Page 65)

SAFETY ON SHIPBOARD

A Section Devoted to the Creation of Safety Consciousness and Accident Prevention

Lights Along the Shore

We moderns are very careless individuals, very thoughtless as to the results of our actions on our own lives and on the life and health of those with whom we come in contact.

As we spin about over the earth and sea in our speedy motor cars, fast streamlined trains, palatial express liners, and swift airplanes, how few of us ever give a thought to the many individuals who are constantly alert to make our paths safe and control us for our own good and the public safety? December is supremely the month for thinking of the other fellow, so let's take a look at some of these individuals on whom we depend for so much of our modern safe navigation, and to whom we give so little credit.

Perhaps the most neglected of all such individuals is the lighthouse keeper. As a class these keepers of the beacon lights of navigation have manifested a devotion to duty, a grim endurance and a personal heroism unequaled by any other group of humans. In the days of the sailing ship it was quite customary to laud the lighthouse keeper in song and hymn and epic. The Grace Darlings and the fathers of Grace Darlings still live in literature. But of recent years we have to search through the files of Lighthouse Service Reports to dig out these tales of patient, enduring bravery under the most adverse and often tragic circumstances.

Service Reports covering the September hurricane that devastated the New England coast reveal in highlights some instances of this type of heroism. Following are extracts from the October issue of the U. S. Lighthouse Service Bulletin:

"Extensive damage to Lighthouse Service property distributed over a wide area in New York, Connecticut, Rhode Island and Masstchusetts was caused by the hurricane which swept the North Atlantic coast on September 21.

"The area of greatest damage included the eastern portion of Long Island, the eastern coast of Connecticut, the entire coast of Rhode Island, and that portion of the Massachusetts coast lying to the westward of Cape Cod. The damage was particularly severe in the neighborhood of New London, Conn.; Narragansett Bay, R. I., and Buzzards Bay, Mass. The most easterly point from which damage was reported was Eastern Point Light Station, Gloucester, Mass.

"The Whale Rock Light Station, in the western passage of Narragansett Bay, close to Narragansett pier, was completely swept from its base and destroyed. In this catastrophe, the first assistant keeper, Walter B. Eberle, the only person at the station at the time, lost his life. The head keeper at the time was on shore and was prevented from returning to the station by the severity of the storm.

"At the Palmer Island Light Station, in New Bedford Harbor, Mass., the dwelling and all other buildings, with the exception of the light tower, were swept away. The wife of the keeper, Mrs. Arthur A. Small, who had first taken refuge in the tower, lost her life in an attempt to go to the assistance of her husband when she saw him washed away by a heavy sea. Mr. Small displayed fortitude of the highest order when, after saving himself and seeing his wife washed away, he went back to his post, remaining throughout the storm and keeping his light in operation until he was relieved the following morning.

"The Prudence Island Light Station, in the eastern passage of Narragansett Bay, was entirely destroyed with the exception of the tower, which remained standing although somewhat undermined. The keeper's wife and son were drowned

Lighthouse tenders like the Hollyhock, shown here, are kept very busy after coastwise storms.

Dependable Insurance Since 1863

Fire · Automobile · Marine · Casualty · Fidelity · Surety

FIREMAN'S FUND GROUP

Fireman's Fund Insurance Company — Occidental Insurance Company
Home Fire & Marine Insurance Company
Fireman's Fund Indemnity Company — Occidental Indemnity Company

Strength Permanence Stability

New York · Chicago · SAN FRANCISCO · Boston · Atlanta

when the dwelling was finally destroyed, and the keeper was able to save himself only after being swept more than a quarter mile from the station. During the height of the storm, a former keeper of the light, now retired, named Martin Thomas, and a Mr. and Mrs. Lynch sought refuge in the dwelling and they, too, were drowned."

The report of the keeper of the Palmer Island Light, dictated from his bed in a hospital after the experience outlined above, is characteristic of the modesty and self-abnegation that animates the lighthouse personnel. Says he:

"In reporting the destruction of and loss of building and equipment at Palmer Island Light Station, New Bedford Harbor, Mass., on September 21, 1938:

"The keeper made preparations all during that day, securing everything so far as possible; carrying extra oil and lamp equipment to the tower.

"This station felt the full force of the gale. The seas breaching clear across the island, sweeping buildings as the sea increased. Keeper swept overboard, but by swimming under water made the station again.

"Mrs. Small, the keeper's wife, was seen by the keeper while he was overboard. She left the oil house where he had told her to stay in the upper part and evidently she tried to launch a boat to save the keeper. But she was swept away and drowned.

"The station is in need of 35 mm I. O. V. equipment and kerosene. All records are gone and stationery and log books needed. There is no shelter to be had at the station except in the top of the tower.

"Keeper remained on duty until properly relieved. The light and fog signal were in good order. Keeper removed to St. Luke's Hospital suffering from exhaustion and exposure."

(Signed) Arthur A. Small,
Keeper.

So it is with the great majority of our modern guardians of safety. The captain on the bridge, the engineer at the throttle, sparks at his key, the safety engineer in the shipyard and on the dock, the patrol on the highway, and all the other "guardians of the open road"—they are the sane, solid minority that keeps this crazy world from going completely off the track. For our own good, for the safety of the race, for the saving of life, property, self-control and morale, let's cooperate with these "Lights Along the Shore."

A New SEAM TESTING SERVICE

A newly developed, accurate seam testing service has just been inaugurated by the American Pipe & Steel Corporation. It is a vacuum method that can be adapted to locating leaks in the bottoms and decks of tanks, ship decks and hulls, and pipe lines.

The patented device used in this service is an air-tight, rectangular-shaped box, equipped with a vacuum gage. The top of the box is covered with glass and soft rubber strips are mounted around the base.

When tests are to be made, a section of the seam is covered with a thick solution of soap suds. The device is placed over the covered area and a strong vacuum is created by means of a suction pump. The tremendous suction compresses the soft rubber base of the device so that air is sealed out. Any imperfections in the seam within the area covered by the tester will permit the inflow of air, which in turn will cause large clusters of soap bubbles to appear at that particular point. Detected through the glass top of the seam tester, these bubbles instantly indicate the presence of a leak, no matter how small it may be.

Inspection of any tank can be made in from one to two hours, or while alternating service. There is no need for costly delays. In the event that new tanks are being erected, caulkers and welders are able to work at a much greater speed, knowing that pin holes will be quickly detected and adjusted. This type of testing service makes it possible for tank bottoms to be laid in a permanent position without risk of causing fractures, as is often the case when they are set up on horses and then lowered into position.

Immense losses due to slow, undetected leakage in tanks can be saved by such a thorough method as this.

Marine Insurance in All Phases — "All Risks" . . . Inland Marine . . . Ocean Marine

STANDARD MARINE INSURANCE COMPANY, LIMITED
NATIONAL UNION FIRE INSURANCE COMPANY
MERCANTILE INSURANCE COMPANY OF AMERICA

GEO. E. BILLINGS CO.

Pacific Coast General Agents—Richard J. Lutich, Marine Manager

GArfield 3646
308 California St.
SAN FRANCISCO

TRinity 1521
Spreckels Bldg.
LOS ANGELES

SEneca 1478
Colman Bldg.
SEATTLE

MARINE DEPARTMENT
AETNA INSURANCE CO.
QUEEN INSURANCE CO.
MARITIME INSURANCE CO., LTD.
FIDELITY PHENIX FIRE INS. CO.
Commercial Hull Dept.
AUTOMOBILE INS. CO.

MATHEWS & LIVINGSTON
Marine Underwriters
200 BUSH ST. SAN FRANCISCO
Offices at: Colman Bldg. - Seattle 111 West 7th St. - Los Angeles

New Hose for Engine Exhaust Pipe

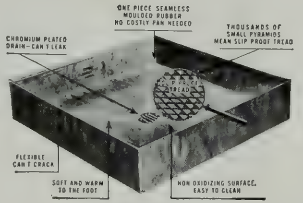
Condor Marine Exhaust Hose has been introduced by the Manhattan Rubber Mfg. Division as a desirable and reliable substiute for cast iron, steel and copper exhaust pipes on motorboats. This new product, designed for wet exhausts on either diesel or gasoline engines, combines flexibility and ease of installation with physical properties that offer many advantages over metal pipe.

Metal exhaust pipes installed on craft operating in salt water become quickly pitted and corroded. In both salt and fresh water a weak sulphuric acid, formed when particles of unconsumed fuel mix with water, has a rapidly deteriorating effect on metal pipe. Metal exhaust pipe also transmits noise and vibration, which is particularly objectionable on pleasure craft.

Condor Marine Exhaust Hose overcomes all difficulties encountered in the use of metal pipe. In addition to being immune from the effects of sulphuric acid and the destructive action of salt water, this hose acts as a dampener to both noise and vibration. It can be bent around obstructions, reducing the cost of original installations and replacements. Since it does not readily transmit heat through its walls, as does metal pipe, it eliminates the danger of discoloring and blistering adjoining partitions and bulkheads.

Condor Marine Exhaust Hose is fabricated from rubber and duck. The inner tube is of heat-resisting rubber, while the outer cover is rugged and oil-resisting. Between its plies of strong duck is embedded a spirally wound wire to prevent collapse and to withstand pressure.

Something New for Shower Bath Stalls


ONE PIECE SEAMLESS MOULDED RUBBER NO COSTLY PAN NEEDED
CHROMIUM PLATED DRAIN—CAN T LEAK
THOUSANDS OF SMALL PYRAMIDS MEAN SLIP PROOF TREAD
TREAD
FLEXIBLE CAN T CRACK
SOFT AND WARM TO THE FOOT
NON OXIDIZING SURFACE, EASY TO CLEAN

Considerable interest in the marine field is being aroused by the new Brunswick Rubberceptor, a one-piece prefabricated shower receptor, which is guaranted by the manufacturers to be slip-proof, flexible, and extremely lightweight.

The Brunswick-Balke-Collender Company recently announced that Brunswick had taken over the manufacture and sale of the Rubberceptor exclusively, and that an intensive advertising program is being inaugurated to consumers as well as to the trade.

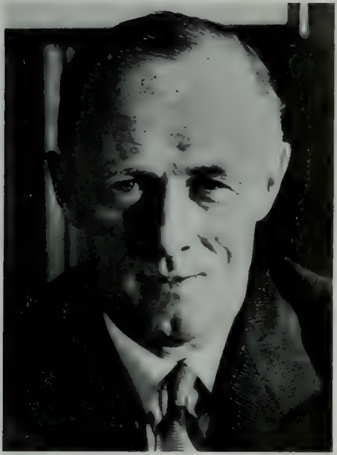
The Rubberceptor is claimed to be 100% sanitary due to its rubber composition, and easy to clean because it has no crevices or corners to hold dirt and germs. The whole receptor is molded from one piece of seamless non-oxidizing rubber.

Brunswick maintains that the Rubberceptor will not leak or crack, even under severe wrenching of ocean travel, because of its permanent flexibility. The water-proof gasket joint is not affected by settling of pipes (which might ordinarily tilt or move the drain), because the drain, being made up to a flexible rubber floor, forms a perfect compression joint.

Thousands of tiny pyramids of rubber eliminate any possibility of slipping on the shower floor, no matter how rough the going—a feature that should be of primary interest to the marine trade.

Furthermore, it is said that the lighter weight of the Rubberceptor solves the problem of long standing in marine construction, and the compatibility of the Rubberceptor with any type of shower wall material makes possible a free range of decorative effects.

Running Lights of Pacific Shipping



JOSEPH R. SHEEHAN

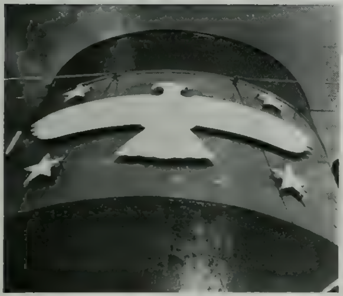
Joseph R. Sheehan, president of American President Lines . . . who in the matter of a few weeks has captured the esteem and respect of Coast shipping men upon his advent from Eastern fields to the San Francisco post. A boyhood pal of Ambassador Joseph P. Kennedy in and around Boston, they played semi-pro baseball—prep school and college. . . . A Harvard alumnus cum laude of 1910. Served as captain of infantry in the big war . . . a year at the front. Mr. Kennedy drafted him from private business into the Securities & Exchange Commission in 1934 where he served two years, returning to his own business until he was named Executive Director of the Maritime Commission. At the helm of the reorganized Dollar Lines he is fast winning friends through his rare personality and natural poise. An excellent speaker, he has appeared before several traffic and maritime groups. Presided recently at the flag-raising ceremony aboard the President Coolidge. A delightful host!

ARTHUR H. ABEL

Arthur H. Abel, Port Manager and Chief Engineer of the Port of Oakland, since May, 1932, at which time he succeeded G. B. Hegardt. The appointment of Mr. Abel culminated some twenty years of association on his part with Mr. Hegardt, whose chief assistant he was for thirteen years at the Port of Portland, where a $10,000,000 port development project was carried out, including the construction of a 15,000-ton drydock, together with widespread dredging operations, prior to their coming to Oakland. Mr. Abel is a graduate of Washington State College and was engaged in extensive railroad engineering operations in the Northwest for the Northern Pacific and North Bank lines, prior to his association with Mr. Hegardt. Now in his seventh year as executive of the Port, he has been mainly instrumental in its great development. His organization harbors ships of the seven seas.

Announcement!

The publishers of Pacific Marine Review take pleasure in announcing that a complete review of Running Lights of Pacific Shipping from our 1938 editions will appear as a 16-page album in our next issue, the January 1939 edition.



Henry E. Frick
New American President Lines Executive

Notable appointment of the month was the naming of **Henry E. Frick** as vice-president in Charge of Operations of the American President Lines.

This happy selection for the important executive post brings to the San Francisco headquarters of APL, the reorganized Dollar Line, a man long-experienced and well-versed in technical and operating subjects. Mr. Frick enjoys many warm friendships in Coast maritime circles with men who have known him during his Maritime Commission, Shipping Board and shipbuilding career.

Since March of 1938 he has served as Chief of the Construction and Inspection Section of the United States Martime Commission.

Mr. Frick was born in Baltimore, Md. From 1896 to 1901 he was employed by the shipbuilding firm of Messrs. Harland and Wolff, Belfast, Ireland, receiving special training in ship construction and marine engineering. He was supervisor of hull construction work for the Maryland Steel Company of Sparrows Point, Md., from 1901-1904. From 1904-1917 he worked for the Fore River Shipbuilding Company, now the Fore River Plant of the Bethlehem Shipbuilding Corporation of New York City, as superintendent and assistant manager. He served with the U. S. Shipping Board Emergency Fleet Corporation from 1917 to 1920 at Bristol, Pa., and at Hog Island, and as district manager of the Northern Pacific District, with headquarters at Seattle, Wash. He also served with the Shipping Board in Philadelphia as Manager of Construction and assistant to vice-president J. L. Ackerson; and from 1921-1924 was European Manager of Maintenance and Repair for the Board in London, England. From 1924-1935, Mr. Frick was vice-president and general manager of the Export Steamship Corporation, and during this time supervised the construction of four Excalibur-type steamers, popularly known as the "Four Aces." During 1936 and 1937 he was associated with Phelps Bros. & Co., Inc., of New York, steamship brokers and operators.

Propeller Club of California Plans Christmas Fete

Tickets are going fast for the 9th Annual Christmas Jinks of the Propeller Club of California. The big affair is scheduled for Friday noon, December 16, at John's Original Rendezvous . . . the picturesque snug harbor up on Osgood Place.

Stanley E. Allen, secretary-treasurer, who by the way has recently been charted and surveyed for a 100 per cent Health Certification after his serious illness, reports grand enthusiasm on the part of our club members.

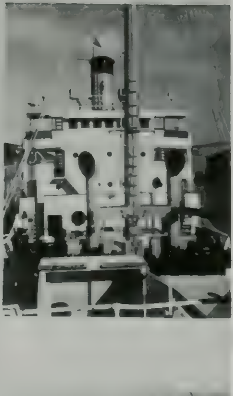
"Something entirely different, more glamourous, more daring; surpassing in good fellowship anything ever attempted before," promises the committee, headed by Fletcher Monson.

Here's a real old-time Yuletide get-together which all hands will want to attend. And, incidentally, Bern De Rochie of Pacific Marine Review has a few choice tickets salted away for those who haven't booked passage. Why not phone him? The tariff, at only $2.50, includes everything!

See you aboard.

● Recent Luncheon Meetings

Lt. Commander W. G. Bloom discussed the functions of the U. S. Maritime Commission training school, of which he is superintendent. The talk was a very informative one and was splendidly received by a good turn-out.



Winslow D. Conn, U. S. Local Inspector of Boilers, was chairman of the day, with **president C. M. Le Count** presiding.

On November 21 one hundred members lunched aboard the California School ship and enjoyed the hospitality of Capt. N. E. Nichols and his officers and cadets.

The lads rang the bell by serving a delightful meal and guiding their guests for inspection tours throughout the ship. It's been many a moon since we've seen such a shipshape vessel. Spick and span from stem to stern!

Kenneth W. Ingraham acted as chairman of the day.

News of "The Bilge Club"

By William A. Mason
Lieut. Commander, U. S. Navy
(Retired)

Approximately 150 members of the Los Angeles Harbor shipping fraternity, the Bilge Club, gathered in Wilmington, California, on November 18 to christen their new club rooms, the "Forecastle," located in the California Yacht Club there.

The new club rooms are situated in the upstairs portion of the yacht club and are of sufficient size to accommodate about 50 members comfortably. The rooms have been fitted out in true nautical style with appropriate ship's pictures and other nautical paraphernalia.

Luncheons will be served in the club rooms from the kitchen of the yacht club and the yacht club bar will be convenient to the members in serving to salute the sun as it appears over the yard arm.

The Bilge Club has been without any official residence since last April, when the "Cookery," their old club rooms, were closed. Since then the members have been meeting at luncheon in groups at such locations as best served their preferences. The new club rooms will afford the members an excellent place to gather with those who are engaged in the shipping business and discuss their mutual problems, to say nothing of settling the perennial question of who is the best domino or cribbage player.

A buffet luncheon with beer was served to the members, who turned out in a manner most satisfactory to the club officers. The Club House Committee, appointed by president Art Pegg and composed of Daniel Dobler, Joe Lang and Hampton Neergaard, deserves the utmost praise for bringing the negotiations with the California Yacht Club to such a successful conclusion and for arranging for the luncheon. This committee also attended to the necessary decoration of the new club rooms.

While the club rooms are of sufficient size to accommodate the daily membership without undue crowding, the facilities of the yacht club dining room are available at such times as the club turns out to welcome some important personage or for its get together dinners.

Many members were heard to express themselves as greatly appreciative of the facilities of the new quarters, which will enable them to entertain their out-of-town friends in true nautical style.

A feature of the luncheon was the receipt of a telegram of greetings from past president James J. Murray, who was unable to attend. Your reporter observed Don Montague and Jim Craig seated together with enough luncheon spread before them to choke an ox. Someone suggested that these two members had been dieting since the old Cookery closed.

This year's president is Arthur Pegg, and the secretary is Lloyd Moore. Bilge Club Board of Directors: Arthur Pegg, president; A. W. Johnson, A. O. Woll, Dan Dobler, J. W. Lang, Hampton Neergaard, Thomas B. Forster. Lloyd J. Moore is secretary and the treasurer is L. S. Anderson.

S. of N. A. M. E. Banquet Scheduled

The Society of Naval Architects and Marine Engineers will hold its Dinner Dance in conjunction with the Forty-sixth Annual Meeting of the Society at the Hotel Biltmore, Madison Avenue at 43rd Street, New York City, Saturday evening, December 3, 1938.

Thomas A. Short Co. in New Offices and Display Rooms

Current activity in Pacific Coast marine and industrial fields brings the **Thomas A. Short Co.** to larger modern ground floor headquarters at 575 Howard Street, between First and Second, in San Francisco.

Greatly increased space in the new location of this well-known marine and industrial equipment sales and engineering firm provides convenient facilities for the display of stocks. The phones of the Short organization are SUtter 7622 and SUtter 7633.

Among the manufacturers represented by Thomas A. Short Co. are the following: Amercoat Sales Agency, Bacharach Industrial Instrument Company, Bridgeport Brass Company, Caterpillar Tractor Company, Diehl Manufacturing Company, Filtrators Company, Hyde Windlass Company, Inter-Coastal Paint Corporation, Moval Products Company, Lucian Q. Moffitt, Inc., Wm. M. Nugent & Company, A. B. Sands & Son Company, Shenango-Penn Mold Company, Short Oil Detectors, Short Oil Separators, Smolensky Valve Company, Submarine Signal Company, U. S. Metallic Packing Corporation, Vulcan Foundry Company, Welin Davit & Boat Corporation, and Western Mat & Supply Company.

THOMAS A. SHORT

Howard L. Asp Appointed S. F. Sales Engineer for Crane Packing Company

HOWARD L. ASP

The Crane Packing Company have recently appointed **Howard L. Asp** as San Francisco sales engineer for their Marine and Industrial Division.

In his six years with the company Mr. Asp has had diversified experience on surface condenser packing problems of both the Marine and Central Station type in the Chicago and New York districts, along with wide experience on pumps and compressors.

In their offices at 112 Ninth Street, San Francisco, the company maintain a complete stock of pump and condenser packings.

Moore-McCormack Appoints Leo E. Archer as GTPM

W. H. Maybaum, passenger traffic manager in charge of the United States Lines here on the Pacific Coast, who are also general agents for the American Republics Line, received a telegram from the New York office recently announcing the appointment of **Leo E. Archer** as general passenger traffic manager of the Moore-McCormack Lines, Inc.

Moore-McCormack Lines are operating the new American Republics Line's "Good Neighbor" fleet, the S.S. Argentina, formerly the S.S. Pennsylvania; the S.S. Brazil, formerly the S.S. Virginia; and the Uruguay, formerly the S.S. California; of the Panama Pacific Line, to Santos and Rio de Janeiro, Brazil and Buenos Aires, Argentine.

Associated with Mr. Archer will be **William Neven,** who has been appointed assistant passenger traffic manager. Mr. Neven has served for the past eleven years with the Moore-McCormack Lines in charge of passenger traffic of the American Scantic Line.

LEO E. ARCHER

CAPTAIN THOMAS J. SULLIVAN

After his appointment as local inspector in San Pedro, friends of Capt. Thomas J. Sullivan presented him with a Chelsea clock informally during his brief visit to San Francisco. A luncheon was planned, at which the clock was to be presented formally, but Capt. Sullivan's stay in the city did not permit carrying out the plans.

Ralph W. Myers, president of the Shipowners Association of the Pacific Coast, was assisted by **Hugh Gallagher,** operating manager of Matson Navigation Company, in making the presentation.

CAPT. JOHN McFARLAND

After an illness of several weeks, Captain John McFarland passed away in San Francisco during the first part of November at an age of over eighty years. For many years he commanded the State quarantine tug Governor Perkins, from which he was transferred to the Geo. M. Sternberg, in the same service.

During his later years, Capt. McFarland was gateman at the docks of the Dollar Steamship Lines, now the American President Lines.

ROY S. WINTEMUTE

After being transferred to San Francisco as vice president of General Steamship Corporation in charge of traffic, Roy S. Wintemute has returned to his former position in Seattle, vice president in charge of Northwest territory. The transfer was due to the passing of J. W. Allen, recently appointed manager in the Northwest to take over most of Wintemute's duties in that district.

CAPT. LEWIS DREWSON

Another old Pacific Coast shipmaster called from the San Francisco waterfront by death is Captain Lewis Drewson, who passed away on October 26 after a lingering illness. He was formerly an officer on the transports Meigs and Ludington, and was later in command of steamers of the Oceanic Steamship Company, plying between San Francisco and Australia. He subsequently was given command of U. S. Shipping Board steamers and Matson Navigation Company ships.

Captain Drewson was 63 years of age at the time of his passing.

LIEUT. CARL H. STOBER

Transferred from his post of commander of the Coast Guard mercy ship Alert after five years' service in Alaskan waters, Lieut. Carl H. Stober has left for Hawaii to take up his duties on the cutter Tanay, stationed in Honolulu.

Lieut. G. D. Synon, formerly of the cutter Duane, stationed in San Francisco, is in Seattle, where he went to take over command of the Alert.

CAPT. CHARLES J. HOLLAND

After suffering a heart attack on November 19, Capt. Charles J. Holland, retired master mariner and former commodore skipper of the Grace Line, died in San Francisco on that date. He was a native of Norway and was 67 years of age.

● Joins USMC

A. T. Ross, whom all the boys call "A. T.," will shortly be leaving us again. Mr. Ross has just accepted a position with the U. S. Maritime Commission as Foreign Representative for the Division of Research. He will be located in Rotterdam.

Since 1930 Mr. Ross has been Vice-President in Charge of Operations for the Southgate Nelson Line. Before taking this position, he was with the U. S. Shipping Board as District Representative in Charge of Operations, covering Belgium, Holland and France.

Mr. Ross, with his practical experience in naval training and maintenance work, will be an excellent asset to the Maritime Commission, but all his friends and acquaintances will surely miss him.

W. O. Bates, Jr., who recently was transferred from the San Leandro, California, offices of Caterpillar Tractor Co. to become head of the Patent Department at Peoria, has been appointed a vice-president of the company. The appointment was made at a meeting of the Executive Committee, held November 16 in Peoria.

JOHN W. ALLEN

From the Northwest comes word of the death of John W. Allen, Northwest manager of the General Steamship Corporation and widely known shipping executive, who passed away at his home at Richmond Beach, Washington. He had recently been appointed to the post of manager, succeeding **R. S. Wintemute,** when the latter was transferred to San Francisco as vice-president in charge of traffic.

Mr. Allen was associated with Mitsui & Co., Seattle, at one time, leaving to establish his own business, the J. W. Allen Shipping Co., agents and brokers. He joined General Steamship Corporation four years ago, where he was in charge of the Oriental department, which is operated in connection with United Ocean Transport Company.

In his last position Mr. Allen had jurisdiction over the company activities on Puget Sound, the Columbia River and British Columbia. He was 48 years old.

CAPT. J. S. MORENO

After a lingering illness, Captain John S. Moreno, State Pilot Commissioner, passed away at his home in San Francisco on October 12. He followed the sea most of his life, formerly being in command of coastwise steamers plying between San Francisco and Crescent City. In later years he became master of the Dollar liner President Taft, relinquishing his command to accept the position of a San Francisco bar pilot, from which illness forced him to retire.

When Captain Edwards, a pilot commissioner, died a couple of years ago, Capt. Moreno was appointed to succeed him, holding the position until his passing.

HUNT-SPILLER GUN IRON

Solves a Big Problem in Steam and Diesel Operation

Hunt-Spiller Air Furnace Gun Iron Cylinder Liners, Pistons, Piston Rings and Heads will help you to solve the major problem of wear in Steam and Diesel Operation.

Extending the period between renewals, this wear-resisting material is helping many operators to obtain maximum efficiency, minimum fuel consumption, and low maintenance costs.

Skilled metallurgical control and foundry practice insures constant uniform material.

Regardless of age, make or design of engine, HUNT-SPILLER AIR FURNACE GUN IRON applied to your cylinder parts will produce maximum efficiency and reduce renewals.

HUNT-SPILLER MFG. CORPORATION

383 Dorchester Ave. South Boston, Mass.

V. W. ELLET
Pres. & Gen. Mgr.
383 Dorchester Ave.

E. J. FULLER
Vice President
South Boston, Mass.

N. B. Robbins
1920 Clemens Rd.
Oakland, Calif.

Thos. G. Baird
16 California Street
KE-1142
San Francisco

HUNT-SPILLER *Air Furnace* GUN IRON

Men Taught by the Sea . . . Never Forget

Marine equipment merits no more respect than it earns—by dependable performance! Men of the sea soon learn where to place their confidence. That is why, since 1865, men who have known the dependability of A-E-CO Deck Auxiliaries have specified A-E-CO for an increasing number of ships! That is why A-E-CO is the outstanding leader. Specify A-E-CO!

Other A-E-CO Products: Lo-Hed Hoists, Hele-Shaw Fluid Power, Taylor Stoker Units

A-E-CO DECK Auxiliaries

AMERICAN ENGINEERING COMPANY

2450 ARAMINGO AVENUE, PHILADELPHIA, PA.

Pacific Coast Representative: HOUGH & EGBERT, Inc. 311 California Street, San Francisco

Building in American Yards

Pacific Coast

BETHLEHEM SHIPBUILDING CORPORATION, LTD.

(Union Plant)
San Francisco

DRYDOCK AND ROUTINE REPAIRS: **Peter Lassen, Associated, Hoyanger, Richmond, M.S. Elg, Knud Rasmussen, American Fisher, American Oriole, M.S. Brajara, Cuzco, Losmar, Vitus Bering, State Dredger No. 4, Haviside Barge No. 4, Tug H. T. Haviside, Makeweli.**

CAMPBELL MACHINE COMPANY

Foot of 8th Avenue
San Diego, Calif.

DRYDOCK AND ROUTINE REPAIRS: **Normandie, Atlantic, Sao Joas, Azoreana, California, Cabrillo, Golden Gate, Lusitania, Navigator, Rose Marie, Ranger, Santo Amaro, Sea Boy, Yvonne Louise.**

GENERAL ENGINEERING & DRY DOCK CO.

Foot of Fifth Avenue
Oakland, Calif.

DRYDOCK AND ROUTINE REPAIRS: **Gas. S. Rose Marie, Gas S. Marettimo, Foy Derrick Barge, Hoquiam, Tug Despatch No. 7, Gas. S. St. Mary, Gas. S. Umpqua, Davenport, Haviside Derrick Barge, Gas. S. Sherman Rose, Lumbertown, Solano, Gas. S. Helen L., Lumberman, M.S. Associates, Tahoe, Pilot Boat California, President Taft.**

HARBOR BOAT BUILDING CO.

Berth 264, Fish Harbor
Terminal Island, Calif.

DRYDOCK AND ROUTINE REPAIRS: **Destiny, Northwestern, White Star, Santa Marguerita.**

HONOLULU IRON WORKS

Honolulu, T. H.

DRYDOCK AND ROUTINE REPAIRS: **M.S. Hawaiian Standard, Lurline, M.S. Trade Wind, Cape St. Andrew, U.S.C.G. Reliance.**

LAKE WASHINGTON SHIPYARDS

Houghton, Wash.

DRYDOCK AND ROUTINE REPAIRS: **M.S. Patterson, C. G. Cutter Atlanta, Ferry Leschi.**

LOS ANGELES SHIPBUILDING & DRY DOCK CORP.

Los Angeles Harbor
San Pedro, Calif.

DRYDOCK AND ROUTINE REPAIRS: **M.V. Capella, Torres, L.A. Fireboat No. 2, Yacht Radio, Yacht Volador, Olympic, Tug David P. Fleming, Tug Jimmie K., M.V. H. D. Collier, M.V. Helgoy, Floridian.**

MARE ISLAND NAVY YARD

Mare Island, Calif.

NEW CONSTRUCTION:

Swordfish, Submarine (SS193); keel laid October 27, 1937; estimated delivery date August 1, 1939.

Two harbor tugs, YT 133 and YT 134; keels laid September 29, 1938.

Garbage Lighter (YG 21); keel laid July 25, 1938.

Order received for construction of one submarine tender, Fulton (AS 11); dated June 30, 1938.

Order received for construction of one submarine, Tuna (SS203); dated June 30, 1938.

DRYDOCK AND ROUTINE REPAIRS: **Chicago, Indianapolis, Langley, Reid, Cummings, Hull, Dewey, Phelps, Worden, MacDonough, Selfridge, Oriole, Turkey, Teal, Melville, Pinola, Henderson, Ramapo, Tarpon, Perch, Porpoise, Shark.**

THE MOORE DRY DOCK CO.

Oakland, Calif.

NEW CONSTRUCTION:

Hulls Nos. 193 and 194, two lighthouse tenders for Bureau of Lighthouses; LOA 174′ 10½″, beam molded 32′, depth 14′ 6″. Twin screw triple expansion engines; water tube boiler; 1000 horsepower. One for Pacific Coast; one for Great Lakes.

DRYDOCK AND ROUTINE REPAIRS: **Tulsagas, Star of San Pedro, McKinley, Diana, M. H. Whittier, Arizonan, Flamingo, Gracie S., North Star, Western Traveler, Redline, Long Island, Montara, J. B. Edwards, Vashon, American Fisher, Blue Water, Farallon, Norby, Sea Maid, Oregonian, Virginia II, Brunswick, Ohioan, Komoku, Sea Lion, Glacier, Santa Rosalia, Kentuckian, El Commodore, Missourian, Frances, President Taft, Puerto Rican, Utahan, Haviside Barge No. 5, Radio, Alaskan, Hercules, Ariadne, Conquest, Barge 1922, Modjokerto, Anglo Peruvian, John-R., Iowan, Yuba, Mathew Luckenbach, Oceania.**

THE PUGET SOUND NAVY YARD

Bremerton, Washington

NEW CONSTRUCTION:

U.S.S. Wilson (Destroyer No. 408); standard displacement, 1500 tons; keel laid March 22, 1937.

U.S.S. Charles F. Hughes (Destroyer No. 428); standard displacement 1600 tons; order placed by Navy Department December 7, 1937.

Ships authorized but work not started: 2 harbor tugs Nos. 138 and 139; 2 seaplane tenders AVP10 and AVP11; 1 destroyer DD436, Monssen.

DRYDOCK AND ROUTINE REPAIRS: **Lexington, Pennsylvania, Tennessee, Bobolink, Wright.**

TODD SEATTLE DRY DOCKS, INC.

Harbor Island
Seattle, Wash.

DRYDOCK AND ROUTINE REPAIRS: **Susan V. Luckenbach, Jacob Luckenbach, North Coast, San Francisco Maru, Yukon, Derrick Scow RB No. 4, North Wind.**

WESTERN BOAT BUILDING CO., INC.

2505 East 11th Street
Tacoma, Wash.

NEW CONSTRUCTION:

Hull No. 131, purse seine fishing boat, 78′x20′x9′; 200 H.P. Atlas engine; launching date May 1, 1938.

Hull No. 132, 50′ pick-up fishing boat for New England Fish Company. Keel laid March 12, 1938.

Atlantic, Lakes, Rivers

ALABAMA DRY DOCK AND SHIPBUILDING CO.

Mobile, Ala.

NEW CONSTRUCTION:

Two all welded steel barges 128′ x 32′ x 7′ 10″.

DRYDOCK AND ROUTINE REPAIRS: **Malacca, Banan, Hagan, Pan Royal, Swiftscout, Coppename, Wacosta, M.S. Molda, Steamboat Missouri, Dredge Mobile, Tug Hulver, A. T. & N. Car Ferry No. 1.**

BATH IRON WORKS

Bath, Maine

NEW CONSTRUCTION: **Hulls Nos. 162 and 163; DD395 Davis and DD396 Jouett; two 1850-ton destroyers for U.S. Navy;** date of contract September 19, 1935. Keels laid No. 162, July 28, 1936; No. 163, March 26, 1936. Launching dates, No. 162, July 30, 1938; No. 163, September 24, 1938;

SHENANGO-PENN MOLD COMPANY

DOVER, OHIO

CENTRIFUGALLY CAST ALLOYS

Bronzes — Monel Metal — Alloy Irons

ANNOUNCES APPOINTMENT OF

THOMAS A. SHORT CO.
575 Howard Street
San Francisco

GREAT WESTERN STEEL COMPANY
1011 East 61st Street
Los Angeles

RAY SMYTHE
301 Park Bldg.
Portland

as representatives in charge of sales and distribution of SHENANGO-PENN products on the West Coast

263 Vessels today

have eliminated mechanical boiler cleaning expense because their owners realize the value of the HALL SYSTEM OF BOILER WATER CONDITIONING.

The Hall Laboratories has earned the confidence and respect of every shipowner it is serving.

HAGAN CORPORATION

BOWMAN BLDG. PITTSBURGH, PA.
1000 - 16th Street - - - - - San Francisco
1925 East Olympic Blvd. - - - Los Angeles

FRANCE

TRADE MARK

Manufactured exclusively by

FRANCE PACKING COMPANY

Main Office and Factory
TACONY, PHILADELPHIA

Sole Authorized Representatives:

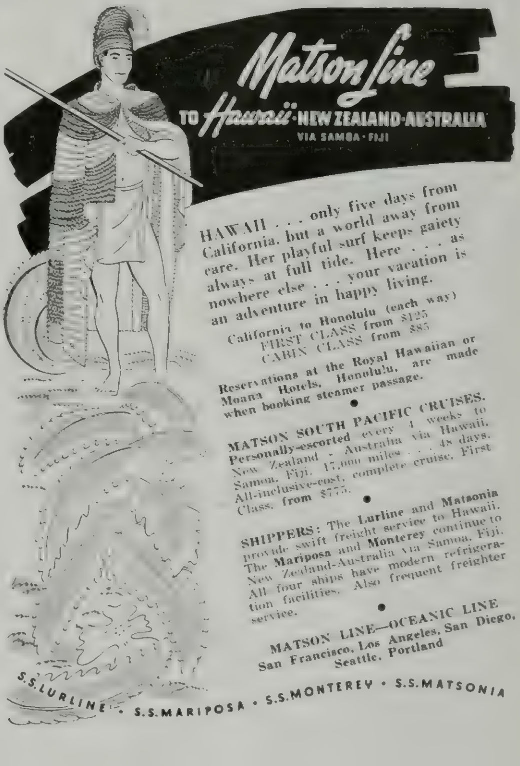
SAN FRANCISCO—HERCULES EQUIPMENT & RUBBER CO.
550 - 3rd Street—EXbrook 2575

SEATTLE—GUY M. THOMPSON
1241 South Alaskan Way—Phone MAin 1870

PORTLAND—E. B. HUSTON
127 S. W. First Ave.—Phone ATwater 6754

LOS ANGELES—A. C. ELDER
2714 South Hill St.—PRospect 9529

NEW YORK CITY—FRANCE PACKING COMPANY
Room 107-E, 30 Church St.—Cortlandt 7-6827


Matson Line
TO Hawaii · NEW ZEALAND · AUSTRALIA
VIA SAMOA · FIJI
S.S. LURLINE · S.S. MARIPOSA · S.S. MONTEREY · S.S. MATSONIA

HAWAII . . . only five days from California, but a world away from care. Her playful surf keeps gaiety always at full tide. Here . . . as nowhere else . . . your vacation is an adventure in happy living.

California to Honolulu (each way)
FIRST CLASS from $125
CABIN CLASS from $85

Reservations at the Royal Hawaiian or Moana Hotels, Honolulu, are made when booking steamer passage.

●

MATSON SOUTH PACIFIC CRUISES. **Personally-escorted** every 4 weeks to New Zealand - Australia via Hawaii, Samoa, Fiji. 17,000 miles . . . 48 days. All-inclusive-cost, complete cruise, First Class, **from** $775.

●

SHIPPERS: The **Lurline** and **Matsonia** provide swift freight service to Hawaii. The **Mariposa** and **Monterey** continue to New Zealand-Australia via Samoa, Fiji. All four ships have modern refrigeration facilities. Also frequent freighter service.

●

MATSON LINE—OCEANIC LINE
San Francisco, Los Angeles, San Diego, Seattle, Portland

estimated delivery dates, November 9, 1938 and January 15, 1939.

Hulls Nos. 170-171, DD409, Sims, and DD410, Hughes, two 1500-ton destroyers for U. S. Navy; contract date October 12, 1936; keels laid July 15 and September 15, 1937, respectively; launching dates, indefinite; delivery dates April, 1939, and June, 1939, respectively.

Hulls Nos. 177 and 178, DD423 and DD424, two 1620-ton destroyers for U. S. Navy. Contract date September 30, 1937; delivery dates April and June, 1940, respectively.

Hulls Nos. 180-181, DD429 and DD430; two 1620 ton destroyers for U. S. Navy. Contract dated August 15, 1938; delivery in 28 and 30 months, respectively.

BETHLEHEM SHIPBUILDING CORPORATION, LTD.

Fore River Plant,
Quincy, Mass.

NEW CONSTRUCTION:

CV7, Wasp, Airplane Carrier for U. S. Government; keel laid April 1, 1936; **estimated launching date December, 1938.**

Hulls Nos. 1467, 1468, 1469, three passenger and freight steamers for Panama Railroad S.S. Co.; 486 feet x 64 feet x 38 feet 6 inches; 16½ knot speed. Keels laid, Nos. 1467 and 1468, October 25, 1937; No. 1469, November 15, 1937; **estimated launching dates** September 24, 1938, **December 10, 1938**, and January, 1939.

Hulls Nos. 1470 and 1471, two 1500-ton destroyers for U. S. Government; delivery dates March, 1940 and May, 1940.

Hulls Nos. 1472 and 1473, two diesel powered trawlers 147′0″ overall, 128′9″ perps., 27′0″ beam, 14′4″ depth; Hull No. 1472 launched October 8, 1938; **No. 1473 launched November 10, 1938; estimated delivery dates November 18 and December 15, 1938.**

Hulls Nos. 1474, 1475, 1476 and 1477, four freight vessels for American Export Lines, Inc.; 450′ B.P. x 66′ x 42′3″; 16½ knots; geared turbines and water tube boilers. Keel laid No. 1474, November 10, 1938.

BETHLEHEM SHIPBUILDING CORPORATION, LTD.

Sparrows Point Plant
Sparrows Point, Md.

NEW CONSTRUCTION:

One tanker for Texas Co.; about 13,000 deadweight tons; steam turbine; launched September 1, 1938.

Hull No. 4334; one 13,000 dwt. oil tanker for Union Oil Co. of Calif. Contract signed March, 1938. **Launching date December 10, 1938.**

Hulls Nos. 4329, 4330, 4331; three 16,300 dwt. ton tankers for Standard Oil Co. of N. J.; 18 knots speed. Contract signed January 3, 1938.

Hulls Nos. 4332 and 4333; two 16,000 dwt. tankers for Socony Vacuum Oil Co. Contract signed February, 1938.

BETHLEHEM SHIPBUILDING CORPORATION, LTD.

Staten Island Works
Staten Island, N. Y.

NEW CONSTRUCTION:

Hulls Nos. 8001, 8002, and 8003, three U. S. Navy fleet tugs. No. 8001, keel laying date January 3, 1939; launching date September 15, 1939; delivery date January 25, 1940. No. 8002, keel laying date January 17, 1939; launching date November 15, 1939; delivery date March 25, 1940. No. 8003, keel laying date January 31, 1939; launching date January 15, 1940; delivery date May 25, 1940.

BOSTON NAVY YARD

Boston, Mass.

NEW CONSTRUCTION:

DD402, Mayrant, and DD403, Trippe, two light destroyers for United States Navy; LBP 334′, beam 35′6″ depth 19′8″; keels laid April 15, 1937; launched May 14, 1938; estimated delivery dates November, 1939 and December, 1939, respectively.

DD415, O'Brien, and DD416, Walke, two destroyers; LBP 341′, beam 36′, depth 19′8″ keels laid May 31, 1938; launching date November, 1939; delivery dates May, 1940 and July, 1940.

DD425, Madison, and DD426, Lansdale, two destroyers; 341′0″ x 36′0″ x 19′8″. Keel laying date February, 1939; launching date November 1, 1939; delivery date 1940.

DD433 and DD434, two destroyers, contract awarded July 23, 1938. Completion date, 1941.

BROOKLYN NAVY YARD

Brooklyn, N. Y.

NEW CONSTRUCTION:

CL 50, **Helena, light cruiser;** L.B.P. 600′ beam 61′7¾″, standard displacement 10,000; geared turbine engines; express type boilers; keel laid December 9, 1936; launched August 27, 1938; estimated delivery January 2, 1940.

BB 55, **North Carolina, battleship;** L.B.P. 714′ 0″, beam to outside armor 108′ 0″, std. displ. 35,000 tons; geared turbine engines; express type boilers. Keel laid October 27, 1937; estimated launching date May 1, 1940; contract delivery September 1, 1941; estimated delivery date October 15, 1941.

CHARLESTON, S. C., NAVY YARD

Charleston, S. C.

NEW CONSTRUCTION:

Order placed for **one harbor tug;** LOA 124′ 9″, length between perpendiculars 117′, breadth molded 28′, depth molded 16′; keel laid August 2, 1937; launched March 7, 1938.

Order placed for **one harbor tug;** LOA 110′ 3″, LBP 98′ 0″, breadth 24′ 0″, depth at side amidships 13′ 6″. No dates set.

Order placed for one **harbor tug;** 65 feet long.

DEFOE BOAT & MOTOR WORKS

Bay City, Mich.

NEW CONSTRUCTION:

Hulls Nos. 72 and 73; two diesel electric harbor cutters for Coast Guard; 110′ x 26′ 6″; powered by 1000 S.H.P. General Motors engines; steel construction. Delivery date April, 1939.

THE DRAVO CORPORATION

Engineering Works Division
Pittsburgh, Pa., and Wilmington, Del.

NEW CONSTRUCTION:

Hulls Nos. 1463-1465, three welded cargo box barges 100′ x 26′ x 6′6″, for stock; 495 gross tons.

Hulls Nos. 1468-1469, 2 welded W-5 coal barges 175′ x 26′ x 10′8″, for stock; 944 gross tons.

Hulls Nos. 1480-1489, ten welded ash removal barges 150′ x 37′ x 12′9″, for Department of Sanitation, City of New York; 5530 gross tons.

Hulls Nos. 1490-1492, three welded steel coal barges 126′ x 34′ x 17′, for stock; 2019 gross tons.

Hulls Nos. 1493-1502, ten welded W-6 coal barges 175′ x 26′ x 10′8″, for stock, 4720 gross tons.

Hulls Nos. 1503-1504, two welded steel oil barges 195′ x 35′ x 9′6″, for stock; 978 gross tons.

ELECTRIC BOAT CORP.

Groton, Conn.

NEW CONSTRUCTION:

Hull No. 29, Sargo (SS188); standard displacement 1450 tons; keel laid May 12, 1937; launching date June 6, 1938; delivery date February, 1939.

Hull No. 30, Saury (SS189); standard displacement 1450 tons; keel laid June 28, 1937; launching date August 20, 1938; delivery date April, 1939.

Hull No. 31, Spearfish (SS190); standard displacement 1450 tons; keel laying date September 9, 1937; launching date October 29, 1938; delivery date June, 1939.

Hull No. 33, Seadragon (SS194); 1450 tons; keel laying date April 18, 1938; delivery date December, 1939.

Hull No. 34, Sealion (SS195); 1450 tons; keel laying date June 20, 1938; delivery date February, 1940.

Hull No. 35, Tambor (SS198); standard displacement 1475 tons; keel laying date January 16, 1939; delivery date January, 1941.

Hull No. 36, Tautog (SS199); standard displacement 1475 tons; keel laying date March 15, 1939; delivery date March, 1941.

Hull No. 37, Thresher (SS200); standard displacement 1475 tons; keel laying date May 15, 1939; delivery date May, 1941.

THE FEDERAL SHIPBUILDING AND DRY DOCK COMPANY

Kearny, N. J.

NEW CONSTRUCTION:

Three destroyers, DD397 Benham, DD398 Ellet and DD399 Lang, 1500 dis. tons; keels laid September 1, 1936, December 3, 1936, and April 5, 1937, respectively; launching dates April 16, June 11 and August 27, 1938, respectively.

Two destroyers, DD411 Anderson and DD412 Hammann; keels laid November 15, 1937, and January 17, 1938, respectively.

Hulls Nos. 151, 152 and 153, three tankers for Standard Oil Co. of New Jersey; keels laid, No. 151, July 1, 1938; No. 152, July 15, 1938.

Hulls Nos. 154-159, six C-2 cargo vessels for U. S. Maritime Commission. Keels laid, No. 154, August 25, 1938; No. 155, September 20, 1938.

Marine and Industrial Equipment

THOMAS A. SHORT CO.

575 Howard Street - SAN FRANCISCO - Phones: SUtter 7622 - SUtter 7623

AMERCOAT SALES AGENCY
Corrosion and Acid Proof Sprayable Plastic Coatings for Concrete, Metal and Wood.
BACHARACH INDUSTRIAL INSTRUMENT CO.
Instruments for Pressure, Temperature and Gas Analysis.
BRIDGEPORT BRASS COMPANY
Condenser Tubes, Tube Sheets, Complete Line Copper and Brass.
CATERPILLAR TRACTOR COMPANY
Marine Diesel Power Plants and Marine Diesel Auxiliary Engines.
DIEHL MANUFACTURING COMPANY
Electric Motors, Generators, Fans and Ventilating Equipment.
FILTRATORS COMPANY
Boiler Water Treatment.
HYDE WINDLASS COMPANY
Deck Machinery, Propellers and Hoisting Equipment.
INTER-COASTAL PAINT CORPORATION
Consol Rust Remover and Consol Paint.
MOVAL PRODUCTS COMPANY
Cleaner for Oil Tanks, Bilges and Heat Exchangers.
LUCIAN Q. MOFFITT, INC.
Goodrich Cutless Rubber Bearing.
WM. W. NUGENT & COMPANY
Oil Filters and Oiling Devices.
A. B. SANDS & SON COMPANY
Marine Plumbing.
SHENANGO-PENN MOLD COMPANY
Centrifugally Cast Metals and Alloys.
SHORT OIL DETECTOR
For Protection of Boilers.
SHORT OIL SEPARATOR
For Bilge and Ballast.
SMOLENSKY VALVE COMPANY
Radialflow Noiseless Check Valves for all Pressures.
SUBMARINE SIGNAL COMPANY
Fathometers for Yachts, Freighters and Passenger Vessels.
U. S. METALLIC PACKING CORPORATION
A complete Packing Service for Marine and Stationary Engineers.
VULCAN FOUNDRY COMPANY
High Tensile Pearlitic Cast Iron Founders, Pattern Makers, Manufacturers.
WELIN DAVIT & BOAT CORPORATION
Lifeboats, Davits, Lifeboat Winches and Floats.
WESTERN MAT & SUPPLY COMPANY
Rubber Mats for all Purposes.

Hyde Windlass Company

Steering Gears, Windlasses, Capstans, Bronze Propellers —as installed on America's finest ships.

Bath, Maine

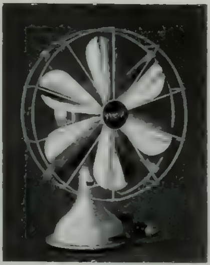
Pacific Coast Representative:
Thomas A. Short Co., 575 Howard Street, San Francisco

Inter-Coastal Paint Corporation

SAN LEANDRO, CALIFORNIA

Originators and sole manufacturers of CONSOL both plain and in colors. A conditioning solution for metal surfaces that have become corroded. Not only a scale remover but a preservative as well. Gives excellent results when applied to boottop belt, hull, holds, bilges, tank tops, chain lockers, ventilator trunks, decks and so forth. Is non-inflammable and contains no acids or chemicals that are injurious to men or metal.

Marine Representative
Thomas A. Short Co., 575 Howard Street, San Francisco

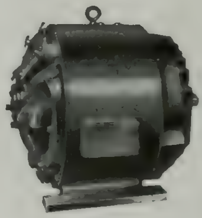


Marine Motors, Generators and Ventilating Equipment

DIEHL MANUFACTURING COMPANY

Electrical Division of
THE SINGER MANUACTURING CO.
Elizabethport, New Jersey

San Francisco Representatives:
MARINE ELECTRIC CO. — Desk and Wall Fans
THOMAS A. SHORT CO. — Motors, Generators, etc.



DAHL-BECK ELECTRIC CO.

- MARINE AND INDUSTRIAL INSTALLATIONS
- MOTOR AND GENERATOR REPAIRING

Representatives for

VAN BRUNT WATERTIGHT FIXTURES AND FITTINGS
A.D.T. AERO AUTOMATIC FIRE ALARM SYSTEMS
C. C. GALBRAITH & SON, INC.—Loud Speaker Systems
SPEER CARBON AND GRAPHITE BRUSHES

115 MISSION STREET - SAN FRANCISCO
Phone: EXbrook 5215

Hulls Nos. 160 and 161, two torpedo boat destroyers for the United States Navy.

INGALLS IRON WORKS CO.

Birmingham, Ala.

NEW CONSTRUCTION:

One 15-ton derrick boat hull for U.S. E.D.; launched June 1, 1938.

Two diesel dredge tenders 63′x15′6″x6′3″ for U. S. Engineer Office, Memphis, Tenn. Launching date about September 10, 1938.

Ten hopper type cargo barges 280′ x 48′ x 11′ for Inland Waterways Corp. Launching dates June to October, 1938.

JAKOBSON & PETERSON, INC.

Brooklyn, N. Y.

NEW CONSTRUCTION:

Hull No. 276, 86-foot all welded steel tug. Launching date August 31, 1938; **delivery date November 15, 1938.**

LEVINGSTON SHIPBUILDING CO.

Orange, Texas

NEW CONSTRUCTION:

Three all welded cargo barges 140′ x 30′ 2½″ x 9′; **delivery date November, 1938.**

One all welded tugboat 80′ LOA, 19′ 7″ beam overall, 9′ depth molded; powered with 380 H.P. Atlas diesel; **delivery date November, 1938.**

One all welded passenger ferry 132′ LOA, 40′ 8½″ beam overall, 10′ depth. Equipped with two 200 H.P. Atlas diesel engines. **Delivery date December, 1938.**

THE MARYLAND DRYDOCK CO.

A Subsidiary of Koppers Company,
Baltimore, Maryland

NEW CONSTRUCTION:

Hull No. 194, single screw steel derrick lighter for U. S. Engineer Office, N. Y. District. LOA 115′ 9⅜″, LBP 110′, beam overall 30′ 8¾″, beam molded 30′, depth molded 11′ 9″, frame spacing throughout 21″, load displacement 438 tons, mean load draft molded 9′ 2½″. Keel laying date October, 1938; **estimated launching date December, 1938.**

DRYDOCK AND ROUTINE REPAIRS:

Lightship No. 48, St. Johns.

THE NEW YORK SHIPBUILDING CORPORATION

Camden, N. J.

NEW CONSTRUCTION:

One destroyer tender for U. S. Navy; order placed December 27, 1937.

One seaplane tender for U. S. Navy; order placed December 27, 1937.

One destroyer tender for U. S. Navy; order placed October 14, 1938.

One seaplane tender for U. S. Navy; order placed October 14, 1938.

NEWPORT NEWS SHIPBUILDING & DRYDOCK CO.

90 Broad Street, New York

NEW CONSTRUCTION:

H362, light cruiser, CL49, St. Louis, keel laid December 10, 1936; launched April 15, 1938; delivery date March, 1939.

Hulls Nos. 363-364, two destroyers, Nos. 413, Mustin, and 414, Russell; keels laid December, 1937; delivery dates April and June, 1939.

Hull No. 369, twin screw mail, passenger and cargo liner for United States Lines Co.; length 723′, beam 92′, depth 45′. Keel laid August 22, 1938.

Hulls Nos. 370, 371 and 372, three oil tankers for Standard Oil Company of New Jersey; gross tonnage about 11,500 tons; L.B.P. 525′, breadth molded 75′, depth molded 39′.

Hulls Nos. 373, 374, 375 and 376, four single screw cargo vessels for United States Maritime Commission; turbine propulsion; gross tonnage about 9000 tons; length 435′, breadth 63′, depth 40′6″.

PORTSMOUTH, N. H., NAVY YARD

Portsmouth, N. H.

NEW CONSTRUCTION:

Six submarines, Sculpin, Squalus, Searaven, Seawolf, Triton and Trout.

THE PUSEY & JONES CORP.

Wilmington, Del.

NEW CONSTRUCTION:

Hull No. 1070, one steel hopper dredge, Chester Harding; 2,500 cubic yard capacity; length overall 308′2″, length B.P. 300′0″, breadth molded 56′0″, depth molded 29′0″. Contract date February 14, 1938; keel laid May 15, 1938; launching date January, 1939; delivery May, 1939.

Hull No. 1071, one steel lighthouse tender, Lilac Class, for Dept. of Commerce, Bureau of Lighthouses. Gross tonnage approximately 700 tons. Keel laid October 17, 1938.

SUN SHIPBUILDING AND DRY DOCK COMPANY

Chester, Pa.

NEW CONSTRUCTION:

Hulls No. 172, 173 and 174, three tankers for Standard Oil Co. of New Jersey; steam turbine; 525′ x 75′ x 39′; 16,300 dwt. Keel laying dates April 18, May 31 and July 14, 1938; delivery dates February 1, April 11 and May 15, 1939.

Hulls Nos. 175-180, six single screw diesel cargo vessels, C-2 design, for U. S. Maritime Commission; equipped with Sun-Doxford engines. Delivery dates July 4, 1939; September 2, 1939; November 1, 1939; December 31, 1939; March 1, 1940, and May 1, 1940.

Hull No. 181, single screw steam turbo electric drive tanker for Atlantic Refining Co.; 521′ x 70′ x 40′. Delivery date March 1, 1940.

Davis Packing Appoint Marine Distributor

Howell H. Ware, Managing Director of Xzit Pacific Co., announces the appointment of his firm as exclusive marine distributors for the metallic packing products manufactured by the F. C. Davis Packing Company of San Francisco. William H. Rudy is the Los Angeles territory representative with offices at 178 East 58th Street. In Seattle the line will be handled by Jack Keel, address 4404 White Building; and in the Hawaiian Islands The Lynch Company of Honolulu will be the representatives.

Davis metallic packing, made in bars and split rings, is self-lubricated and anti-friction. The bars are made up in all packing sizes from ¼ inch to one inch advancing by 16ths. The product was developed by the late F. C. Davis, well-known marine and industrial engineer of San Francisco. The plant of the Davis organization at 182 Sixth Avenue, San Francisco, has been in the same location for twenty years.

Offices of the Xzit Pacific Co. in San Francisco are located at 779 Bryant Street.

Trade Literature

The New Lincoln "Shield-Arc": A well illustrated and comprehensive 20-page booklet giving the story of the new arc welding technique made available by the Lincoln "Shield-Arc" Welder with self-indicating dual continuous control.

This bulletin, printed in two colors, discusses in detail the operation of welder control, interpreting the electrical performance in terms of mechanical welding results. It explains the need for control of the slope of the volt ampere curve in order to vary the type of welding arc to suit various working conditions, types of joints and classes of work. It shows how this new welder provides complete control of the type and size of welding arc and gives the operator an accurate indication of the setting of the welder both as to the type of work and number of amperes.

This bulletin also lists and explains the 31 features of the performance and construction of the "Shield-Arc" Welders and gives statements from users relative to the specific advantages gained in the field.

XZIT

BALTIMORE, MARYLAND:
Chamber of Commerce Building
(Calvert 5829)

BOSTON, MASSACHUSETTS:
11 Farnsworth Street
(Hubbard 9032)

DETROIT, MICHIGAN:
1627 W. Fort St.
(Randolph 3540)

ATLANTA, GEORGIA:
200 Peachtree Street

HOUSTON, TEXAS:
423 Broadway
(Wayside 3966)

CHICAGO, ILL.:
407 South Dearborn St.
(Harrison 4977)

CLEVELAND, OHIO:
9101 Detroit Avenue
(Woodbine 1730)

MOBILE, ALA.:
57 North Water Street
(Dexter 3779)

SAVANNAH, GA.:
11 West Bay Street
(Tel. 8811)

PHILADELPHIA, PA.
1215 Commercial Trust Bldg.
(Rittenhouse 2496)

HONOLULU, T. H.:
919 Bethel St.

PORTLAND, ORE.:
45 S. W. First Avenue

SEATTLE, WASHINGTON:
1241 Railroad Ave. South

LOS ANGELES, CALIF.:
178 E. 58th Street
(Century 25227)

NEW ORLEANS, LOUISIANA:
916 South Peters Street
(Raymond 3203)

Fire Scale and Soot Eradicator

A product backed by a nationwide organization to render helpful service to shipowners and their engineers.

There is an XZIT man in your district—At your service!

● **XZIT**

THE FIRE SCALE AND SOOT ERADICATOR

This scientific combination of chemicals eliminates soot, cracks off existing scale and prevents new scale from forming. Used and endorsed by leading Engineers in both Marine and Industrial fields. We will gladly demonstrate XZIT to you. Phone or write for full information.

XZIT SALES COMPANY

Hoboken, N. J.
1031 Clinton Street

779 Bryant Street, San Francisco
SUtter 7338

We salute the new bearers of an old tradition

American President Liners sail again the seven seas, heralding the long-awaited rejuvenation of the American Merchant Marine.

That FEDERATED XXXX NICKEL BABBITT was designated for the reconditioning of bearings in these vessels is new testimony to the high regard in which FEDERATED products are held wherever ships put out to sea.

FEDERATED
METALS DIVISION
American Smelting and Refining Company

SAN FRANCISCO, U.S.A.
LOS ANGELES • PORTLAND • SEATTLE

AMERICAN REPUBLICS LINE
The Neighbor Fleet

Check
THIS NEW TRADE ROUTE to SOUTH AMERICA!

✓ The S. S. BRAZIL, S. S. URUGUAY and S. S. ARGENTINA, modern express liners of the new Good Neighbor Fleet, leave New York every other Saturday for the east coast of South America.

✓ These fast ships reach Rio de Janeiro in 12 days; Santos, 14 days; Montevideo, 17 days; Buenos Aires, 18 days.

✓ Your perishable and semi-perishable freight is assured expert handling and care—while loading, en route, and unloading.

✓ Additional fast cargo vessels of the American Republics Line serve all Atlantic ports of the United States and the main outports of eastern South America.

For rates and further information write:
AMERICAN REPUBLICS LINE
Moore-McCormack Lines, Inc.
Managing Agents,
5 Broadway, New York, N. Y.

SAILINGS
S.S. URUGUAY
December 3
S.S. ARGENTINA
December 17
S.S. BRAZIL
December 31

See the Americas First *and trade with*
VIA AMERICAN REPUBLICS LINE TO BRAZIL · URUGUAY · ARGENTINA

FOR FAST, DEPENDABLE SERVICE TO *ALL* PARTS OF THE WORLD, SHIP

French Line

FAMOUS FOR 74 YEARS

Moroccan Service • Mediterranean Service • North Pacific Coast Service • West Indies, Cuba and South America Service • Mexico, Cuba, Spain Service.

New York to England, France, and thus to all Europe:
NORMANDIE
(World's Largest Ship)
ILE DE FRANCE
PARIS
CHAMPLAIN
DE GRASSE

General Agents for Messageries Maritimes, Chargeurs Reunis and Compagnie Sud-Atlantique, Air-France.

FRENCH LINE
222 Stockton St., San Francisco, Calif.; 510 W. 6th St., Los Angeles, Cal.; 307 White Bldg., Seattle, Wash.; 966 Hastings Street W., Vancouver, B. C., 19 State St., New York.

Pacific Paint & Varnish Co.

Snythex Red Lead Primer (Q. D.)
" Anti-Corrosive
" Anti-Fouling
" White Enamel-Non-Bilge (O.S. & I.S.)
" Cabin Enamels (Q. D.)
" Mast Colors, Hull Black
" Boottopping, etc.

Synthex Marine Spar Varnishes and Yacht White Enamel

Aluminum Enamel

Flat White (Inside & Outside)

A specialized finish for each paintable surface.

Pacific Marine Finishes have been used successfully for years by most of the important steamship companies. Each represents a specially developed product for a specific purpose. Quality—not price—is the objective of our Research Department.

L. M. DuCOMMUN
President

San Francisco and Berkeley

A. B. ROBERTSON
Vice President

SWAYNE & HOYT, Ltd.

SHIPOWNERS *and* AGENTS

215 Market Street - San Francisco, California, U.S.A.

GULF PACIFIC LINE
(Between Gulf Ports and Pacific Coast)

CALMAR LINE
(Between North Atlantic and Pacific Coast)

YAMASHITA LINE
(Far East—New York—South America)

OFFICES:
Seattle - Portland - San Francisco - Oakland - Los Angeles - Chicago - St. Louis - Cincinnati - New York
New Orleans - Mobile - Birmingham - Houston

AMERICAN PRESIDENT LINES

Formerly Dollar Steamship Lines Inc., Ltd.

Announces

REGULAR — FREQUENT — DEPENDABLE

Sailing Schedules

...FOR...

ROUND-THE-WORLD AND TRANSPACIFIC SERVICES

EXPRESS FREIGHT — PASSENGER — REFRIGERATOR VESSELS

American President Lines
Robt. Dollar Building
San Francisco

NEW YORK
BOSTON
CHICAGO

OFFICES AND AGENCIES THROUGHOUT THE WORLD

DETROIT
WASHINGTON, D. C.
LOS ANGELES

BIRD-ARCHER CO. of Calif., Inc.

BOILER WATER TREATMENT

Specialists in Marine Feed Water Problems

We have successfully treated and serviced the boilers of every new high pressure steamer built for Pacific Coast operation in recent years.

"SERVICE BACKED BY EXPERIENCE"

Seattle
Portland

19 FREMONT STREET, SAN FRANCISCO

Wilmington
Honolulu

Agents for "BACITE" Cold Set Cement for the insulation of living quarters aboard ship.

SANDUSKY CENTRIFUGALLY CAST

BRONZE - BRASS - MONEL
TAIL SHAFT LINERS
PUMP LINERS - BUSHINGS

SANDUSKY FOUNDRY & MACHINE CO.
SANDUSKY, OHIO

TRADE LESLIE MARK

PRESSURE REDUCING VALVES
PUMP GOVERNORS
TEMPERATURE REGULATORS
SELF CLEANING STRAINERS

TRADE TYFON MARK

WHISTLES
SIGNALS

LESLIE CO., FOUNDERS AND MANUFACTURERS
LYNDHURST, N. J.
John H. Marvin, 1016 First Ave. So., Seattle

CORDES BROS., 200 DAVIS ST., SAN FRANCISCO

Exide
IRONCLAD MARINE BATTERIES

FOR MONEY SAVING SERVICE

These are days for values. The man who selects an Exide Battery for a boat, whether it be a small work boat or an ocean liner, can be sure of one important thing—he is buying long, reliable, low-cost service from a high quality product sold at a reasonable price.

There are Exides for every type and size of craft, for every battery application, made by the world's largest manufacturers of storage batteries for every purpose.

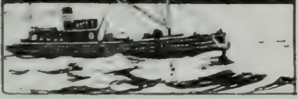
THE ELECTRIC STORAGE BATTERY CO., - - Philadelphia, Pa.

LOS ANGELES, CALIF.
1043 So. Grand Ave.

SAN FRANCISCO, CALIF.
6150 Third Street

SEATTLE, WASH.
1919-20 Smith Tower Bldg.

DECK SENSE



Protect your Calking Investment by using a Good Grade of Marine Glue

Economy in deck maintenance must be reckoned over a period of years. Initial cost may favor a low-priced glue, but a job well done with Jeffery's will give longer and better service. Use JEFFERY'S for economy.

Stocks carried by leading Pacific Coast chandlers.

*Jeffery's No. 2 shows about 10% greater volume.

GEORGE S. LACY
16 California Street
San Francisco, Calif.

L.W. Ferdinand & Co.
599 Albany St. Boston, Mass.

*Jeffery's No. 1 shows about 20% greater volume.

RALSTON R. CUNNINGHAM CO.
73 Columbia St.
Seattle, Wash.

TOUMEY ELECTRIC & ENGINEERING CO.

Representing
BENDIX MARINE PRODUCTS CO.
Successors to
CHAS. CORY CORPORATION
Signaling, Communicating and Lighting Equipment
PNEUMERCATOR CORPORATION (New York)
Gauges: Liquid Level, Ships Draft, Pressure, Boiler Water Level
PLANT MILLS DIRECTION INDICATOR AND ENGINEER'S ALARM

MARINE AND INDUSTRIAL ELECTRIC INSTALLATIONS . . . MARINE ELECTRIC FIXTURES . . . SUPPLIES AND REPAIRS . . . ARMATURE WINDING . . . . SEARCHLIGHT PROJECTORS . . . . SOUND POWERED TELEPHONES . . . FIRE ALARM SYSTEMS

GArfield 8102 SAN FRANCISCO 115-117 Steuart St.

Oakland Municipal Terminals

— Superior and Dependable Service —

Outer Harbor Terminal
Grove Street Terminal
Ninth Avenue Terminal
Livingston Street Pier
Dennison Street Pier

Oakland Municipal Airport

For additional information, write

PORT OF OAKLAND

Grove Street Terminal Oakland, California

Morrison & Bevilockway

Established in 1890

MARINE PLUMBING
STEAM FITTING and SHEET METAL WORK

Sole Agents and Manufacturers of the New M & B Automatic Lifeboat Drain Plug — Expert Lifeboat Repairs and all kinds of Air Duct Work — Galley Ranges Repaired — Monel and Stainless Steel Dressers Manufactured

Day & Night Service
Tel. Do. 2708-09

166 Fremont St.
San Francisco

At Night Call He. 4346 or Burl. 129

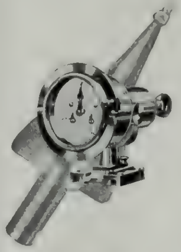
In tube cleaners as in everything else, nothing takes the place of experience.

ELLIOTT COMPANY

LAGONDA TUBE CLEANER DEPT.
LIBERTY TUBE CLEANER DEPT.

Factory Sales and Service Maintained
813 RIALTO BLDG., SAN FRANCISCO
Phone SUtter 5213

Los Angeles, 1732 E. 7th St. Seattle, Wn., 414 Vance Bldg.



Through Nautical Instrument Dealers

The reputation of
WALKER'S LOGS
for accuracy & reliability is world-wide.

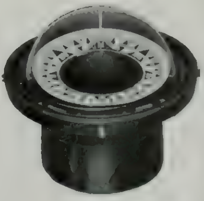
Illustration shews
WALKER'S "CHERUB" III LOG

This instrument will run the longest sea passage with one filling of Walker's Solidified Oil — Registers up to 1000 miles — Mechanism is well protected against grit, ashes & spray.

Thos. Walker & Son, Ltd.,
58, Oxford Street, Birmingham, Eng.
T W

The KELVIN WHITE SPHERICAL COMPASS

112 STATE ST.
BOSTON



Contributing to your overhead economies!

PLYMOUTH ROPE . . . offers longer life and greater dependability in hard service because of its unsurpassable QUALITY

PLYMOUTH 1824

PLYMOUTH CORDAGE COMPANY
NORTH PLYMOUTH • MASS

Distinguished

Enjoy every luxury and convenience of fine living at The Drake. Located on Chicago's famous Gold Coast, convenient to the shopping and business centers. Overlooking Lake Michigan.

A. S. Kirkeby, Managing Director

The Drake

LAKE SHORE DRIVE • CHICAGO

Superb Living

An address of prestige where the discriminating traveler may relax in an atmosphere of refinement. Under the same management as The Drake and The Blackstone in Chicago.

A. S. Kirkeby, Managing Director

The Town House

ON WILSHIRE BOULEVARD

LOS ANGELES

COMFORT •

Rooms 555 Baths

from $2.50 PER DAY

Visit the "TAVERN"

a quiet retreat—tucked away in the rear of the lobby.

New HOTEL CLARK

Fifth and Hill in Downtown

LOS ANGELES

Convenience is another offering of this hotel. Whether on business or pleasure bent, the Hotel Clark makes an ideal "base of operations," as well as a restful "billet" at the end of the day's "campaign." Good Food naturally. And moderate charges, as well as for room accommodations, give final significance to assuring word—COMFORT.

Personal Management of P. G. B. MORRISS

ON THE WAYS

(Continued from page 45)

• Federal Gets Six C-3 Steamers

On November 22 the U. S. Maritime Commission awarded to the Federal Shipbuilding and Dry Dock Company a contract to build six C-3 type, 16½ knot cargo vessels at $2,443,000 each on an adjusted price basis. The fixed price basis bid of Federal for six of these ships was $2,614,000.

The call for tenders of bids on this job specified a total of 12 vessels to be built, not more than six of which would be awarded to any one yard.

Sun Shipbuilding & Dry Dock Co. was lowest bidder on a basis of four vessels, with a fixed price bid of $2,614,000 each, and an adjusted price bid of $2,501,000 each. Sun bids included a tender for diesel propulsion instead of steam turbines at $240,000 additional per ship.

• Battleship Bids

On November 2 the U. S. Navy Department received three bids for the construction of one of the three new type 35,000 ton battleships.

Fore River Plant, Bethlehem Shipbuilding Corporation, Ltd., bid $52,145,000 for hull and machinery complete. Adjusted price basis. Delivery 52 months.

New York Shipbuilding Corporation bid $54,794,000, hull and machinery complete; adjusted price basis; 52 months delivery.

Newport News Shipbuilding and Dry Dock Company bid $49,640,000 for one of the ships minus boilers, turbines and gears; adjusted price basis; 52 months delivery.

To get complete cost of these vessels, approximately 40 per cent must be added for the guns, firing control, armor and other items furnished by the Navy. The Navy experts estimated that the ships would cost $70,000,000 each, so the low bid is not much out of line.

• Historic Suquamish to Become Yacht

The historic diesel passenger vessel Suquamish, first diesel powered passenger vessel built in the United States (back in 1914) is to be converted for Russ Gibson of Seattle into a yacht for service in Alaskan waters. The Suquamish is an 84 ft. wooden vessel and was built before the War for the Kitsap County Transportation Co. for service between Seattle and Bainbridge Island. She was named in honor of the Suquamish Indian tribe, over which Chief Seattle ruled. The historic vessel will be rebuilt by the Lake Washington Shipyards and have a new diesel engine fitted.

• High Pressure Steam Plants

Marine installations of high-pressure, high-temperature steam generating systems, a principal issue in the sharp controversy that is dividing U. S. naval construction experts, have proved so successful on two tankers recently completed for The Atlantic Refining Company at the Sun Shipbuilding and Dry Dock Company that a third tanker now under construction for the company at the same yard will be driven by a system operating at a still higher degree of superheat.

Atlantic's 18,500-ton tankers, the S.S. J. W. Van Dyke and the S.S. Robert H. Colley, have been in service since last February and August, respectively, with steam generating systems operating at 625 pounds pressure and 835 degrees Fahrenheit. The third tanker, now under construction, will be driven by a system operating at the same pressure but at a steam temperature of 920 degrees.

The successful operation of this type of steam generating system, as demonstrated by the S.S. J. W. Van Dyke and Robert H. Colley, is attracting wide attention in ship designing and construction circles, and is expected to lead to increased employment of such installations.

• Bethlehem Steel Consolidates

E. G. Grace, president Bethlehem Steel Corporation, has announced that Bethlehem Shipbuilding Corporation, Ltd., has been merged into Bethlehem Steel Company, as a further step in the program of consolidating various subsidiaries of the Bethlehem Steel Corporation, which was begun in 1936.

All business heretofore conducted by Bethlehem Shipbuilding Corporation, Ltd., will be conducted by a new division of Bethlehem Steel Company created to take over Bethlehem's shipbuilding and ship repair activities. These activities will continue under the supervision of S. W. Wakeman, vice president, with headquarters at 25 Broadway, New York City, and Quincy, Massachusetts.

TRADE NOTES

Columbia Steel Announces Change

Effective November 15, The Columbia Steel Company announced that their Pacific Works, located at Sixteenth and Folsom Streets, San Francisco, will be amalgamated with the Pittsburg, Contra Costa County, Works.

While Pacific Works will lose its identity as an individual plant, operations will be maintained as at present. In making known the change O. L. Pringle, vice president in charge of operations, stated that henceforth the plant will be known as the rope and fence department of the Pittsburg Works.

Shenango Penn Reenter Coast Marine Field

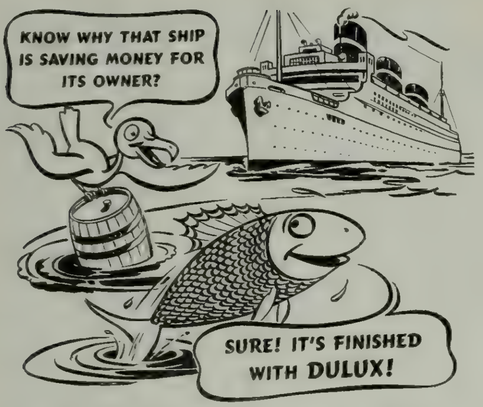
Indicative of the improved prospects for shipping and shipbuilding on the Pacific Coast is the arrangement for coastwise representation announced by the Shenango Penn Mold Company. This firm is the largest manufacturer of centrifugally cast metals and alloys in the United States and their bronze sleeves for propeller shafts are always very much in evidence when new ships are being built.

Shenango Penn announces the following appointments:

Thomas A. Short Co. of San Francisco, covering the marine field in Central and Northern California;

Great Western Steel Co. of Los Angeles, covering the marine field in Southern California; and

Ray Smythe of Portland, covering the marine field in the Pacific Northwest.


KNOW WHY THAT SHIP IS SAVING MONEY FOR ITS OWNER?
SURE! IT'S FINISHED WITH DULUX!

YES, DULUX does save money! Its amazing durability means *fewer* repaintings and lower overhead.

DULUX stands up better under the brutal exposure marine finishes must meet—hot suns, salt spray, salt air. It does not readily chip or crack. And it is highly resistant to discoloring harbor gases.

If you'd like complete information about this more durable, more economical finish, just write to: E. I. du Pont de Nemours & Co., Inc., 235 Second Street, San Francisco; 2419 South Grand Avenue, Los Angeles; 525 Boren Avenue, North, Seattle.

DU PONT DULUX
REG. U.S. PAT. OFF.
MARINE FINISHES

HAVISIDE COMPANY

Largest Commercial Heavy-Lifting and Salvage Barges on the Pacific Coast

Four Derrick Barges - - - Capacity up to 100 tons
Submarine Diving

SHIP CHANDLERS
Specialists: Yacht Sails and Yacht Rigging
Complete stock of Yacht and Motorboat Supplies

Agents for
Columbia Steel Co.'s Products (Subsidiary U. S. Steel Corporation)
American Marine Paint Co. Jeffrey's Marine Glues
Tubbs Supercore and Manila Rope Stratford's Best Oakum

HAVISIDE COMPANY
SAN FRANCISCO
56-62 Steuart Street - - - Phone EXbrook 0064

. . THE . .

"Arcform" Ships at Sea

These vessels have proved themselves in actual performance the most efficient and economical ships of their class in operation today.

The Masters and Officers of the three "Arcform" cargo vessels at sea report their behaviour is consistently EXCELLENT and especially so IN BAD WEATHER.

The Steel Hatches fitted in these vessels have given the utmost satisfaction and are unquestionably an additional source of safety against foundering.

Sir Joseph W. Isherwood & Co., Ltd.

4 Lloyd's Avenue
London : E.C.3

New York : U.S.A.
17 Battery Place

San Francisco Bar Pilots

"Adventuress," "California," "Gracie S"
RADIO — K F S

SIGNALS FOR PILOTS

In Fog—Blow four whistles and lay to.

When Clear—Burn blue light or give four flashes on Morse lamp.

Daylight—Set Jack at foremast.

SIGNALS DISPLAYED BY PILOT BOATS

When on Station Under Sail—A white light is carried at masthead.

When Under Power—A red light under white; a flare or torch is also burned frequently.

TELEPHONES—Pilot Office from 9:00 a.m. to 4:00 p.m.—DOuglas 5436. Chamber of Commerce from 4:00 p.m. to 9:00 a.m. and on Sundays and Holidays—EXbrook 4511.

-LUCKENBACH-

EASTBOUND SERVICE SAILINGS WEEKLY WESTBOUND SERVICE
MANHATTAN - - BROOKLYN - - PHILADELPHIA - - BOSTON
PROVIDENCE MONTHLY

SAILINGS EVERY 14 DAYS TO AND FROM NEW ORLEANS - MOBILE - HOUSTON

FREQUENT SAILINGS TO AND FROM TAMPA

TRAVEL BY FREIGHTER

LUCKENBACH LINES
100 Bush Street, San Francisco
Head Office: 120 Wall Street, New York

PASSENGERS AND FREIGHT

The Largest and Fastest Freighters in the Intercoastal Trade